

C
Iza 225

Lee
Coll.

DEPARTMENT OF AGRICULTURAL ECONOMICS
UNIVERSITY OF ILLINOIS
AGRICULTURAL EXPERIMENT STATION

ILLINOIS
AGRICULTURAL
ECONOMICS

THE LIBRARY OF THE
JAN 30 1964
UNIVERSITY OF ILLINOIS

A R T I C L E S I N T H I S I S S U E :

- Minimum Resources for Specified Incomes
on Corn Farms and Hog Farms,
Velmar W. Davis.....Page 1
- Custom Work and the Farmer's Machinery-
Investment Decision, Norman Coward....Page 9
- Implications of the European Common Market
for the United States, Roland W. Bartlett Page 15
- Agriculture and the European Common Market,
Stephen C. Schmidt.....Page 25
- Farm Organization in the U.S.S.R., C. B. Baker
and E. R. Swanson.....Page 36

In planning a farm business, the usual question is "How can I best use my fixed resources in order to get the most income?" In the first article in this issue, the problem of farm planning is approached from the opposite direction, with the question, "What is the minimum-cost combination of resources necessary to achieve a given level of income?" This represents the longer-run viewpoint of a farmer starting with a clean slate and having the option of selecting the farm size, power, machinery, equipment, livestock, cropping system, and labor force that give him the desired income at minimum cost. The results of this study are pertinent to policy discussions on farm size.

Custom work in agriculture usually means a combination of leasing a machine and hiring the operator in a single transaction. The growth of custom work in the last few decades has resulted in part from the development of specialized, highly mobile, high-capacity harvesting machines, which have high investment costs. The decision of whether to buy a machine or to hire custom work is frequently faced by farmers. The second article outlines factors to consider in making this choice.

The influence of developments in the European Common Market on the United States is a good example of the interdependence among nations in the contemporary scene. The third article in this issue compares the growth rates of the Common Market with those of the European Free Trade Area and the United States. The mixed pattern of the expected volume of various categories of U.S. exports is outlined — some products are likely to enjoy increased demand, others will not fare so well. The development of regional trading blocs similar to the European Common Market in other parts of the world is noted.

The fourth article examines the nature of agricultural imports into countries of the European Common Market during the last decade and the agricultural policies of these countries. This provides a basis for appraisal of the prospects for export of American agricultural products, particularly wheat and feed grains. While the rise in wheat production in the EEC will tend to reduce its reliance on outside markets, the expanding demand for feed grains is not likely to be matched by increases in EEC production. Much depends, of course, on the common level of agricultural prices established within EEC.

Interest in the agriculture of the Soviet Union stems in part from a number of sharp contrasts that may be drawn between its agriculture and that of the United States. In the Soviet Union there is an officially acknowledged problem of increasing food production; in the United States the problem is one of reducing the stocks of government-held commodities. There are a number of other contrasts that could be made — soil resources, climate, levels of mechanization, labor force, and the farming system. The way in which Soviet agriculture is organized and some of its problems are discussed in the last article in this issue.

ILLINOIS AGRICULTURAL ECONOMICS

Minimum Resources for Specified Incomes on Corn Farms and Hog Farms¹

VELMAR W. DAVIS

TO IMPROVE THEIR INCOMES, farmers are making two main kinds of adjustments: (1) Many are moving into more remunerative nonfarm employments, and (2) many of those staying on the farm are reorganizing their agricultural production into larger units. These complementary adjustments are rapidly changing the structure of our agriculture. Data from the censuses of agriculture show that since World War II the total number of farms in the United States has decreased by one-third. However, the number of farms with over \$10,000 in gross sales has increased by nearly two-thirds. Thus the decrease in total number of farms is mainly a decrease in farms with less than \$10,000 in gross sales. The rapid decrease in the number of these farms indicates they lack sufficient resources and productivity to yield satisfactory levels of earnings. Despite these rapid changes, however, only about one-third of all commercial farms in 1959 achieved gross marketings of \$10,000 or more.

Limited information is available on the amounts of land and other resources, as well as investment, needed to obtain different levels of income from the major types of farms in different farming re-

gions. Such information is needed by farm-policy makers, including Congress, by investment and lending institutions, and by farm people who are trying to improve their earnings through (1) shifting into more remunerative nonfarm occupations and (2) reorganizing their farms.

Comparable earnings for farm and nonfarm employment have often been advanced as a policy objective. To study the implications of this objective in terms of resource requirements, a range of income levels comparable to nonfarm employment earnings of semi-skilled workers was selected. The four selected levels of incomes (\$2,500, \$3,500, \$4,500, and \$5,500) are in line with the upward trend of earnings of nonfarm workers.

Two major types of Illinois farms were studied — corn (cash-grain) farms and hog farms. An area consisting of nine counties in east-central Illinois on predominately Drummer-Flanagan soils was selected to represent corn farms. The hog farms were represented by a farming area of eight counties in western Illinois on Tama-Muscatine soils.

In the 1959 Census of Agriculture, 66 percent of the commercial farms in the corn farm area were classified as cash-grain compared with 14 percent hog or beef cattle farms (Table 1). In contrast, for the hog farm area, 21 percent of the farms were classified as cash-grain and 57 percent hog and beef cattle farms. For Illinois, cash-grain farms accounted

¹ This study of corn farms and hog farms in Illinois is part of a broader study conducted by the Farm Production Economics Division, Economic Research Service, U.S. Department of Agriculture. Other specified farm types and geographic areas are included in the overall study plans.

Table 1.—Percentage of Farms in Corn Farm and Hog Farm Areas by Type of Farm and Economic Class, Illinois^a

Type of farm	Corn farm area, Drummer- Flanagan soils ^b	Hog farm area, Tama- Muscatine soils ^c	Illinois
Cash-grain.....	66	21	38
Livestock.....	14	57	28
Other ^d	20	22	34
Commercial farms (Class and value of products sold)			
I — \$40,000 and over.....	4	10	5
II — \$20,000 to \$39,999.....	16	19	14
III — \$10,000 to \$19,999.....	46	30	31
IV — \$5,000 to \$9,999.....	24	24	28
V — \$2,500 to \$4,999.....	9	14	17
VI — \$50 to \$2,499.....	1	3	5
Total.....	100	100	100

^a Census of Agriculture, 1959.

^b Includes Champaign, Coles, DeWitt, Douglas, Edgar, Mason, McLean, Moultrie, and Piatt counties.

^c Includes Fulton, Henry, Knox, McDonough, Mercer, Peoria, Stark, and Warren counties.

^d Includes general, poultry, dairy, fruit, vegetable, and miscellaneous farms.

for 38 percent of all farms and hog and beef cattle farms for 28 percent.

Although many of the farms in the corn farm and hog farm areas afford adequate earnings, a large percentage of the farm operators have medium to low labor and management incomes. From the relationship found in the study, returns to the farm operator's labor and management comprise about 20 percent of the value of farm products sold. On this basis, 80 percent of the farmers in the corn farm area and 71 percent of the farmers in the hog farm area received \$4,000 or less labor and management incomes in 1959 (Table 1). Only 4 percent of the operators in the corn farm area and 10 percent of those in the hog farm area received incomes of \$8,000 or more.

Objective of the Study

The objective of this study was to determine the *least cost* combination of resources needed to obtain specified levels of earnings for the labor and management of farm operators for corn

farms on Drummer-Flanagan soils in east-central Illinois and for hog farms on Tama-Muscatine soils in western Illinois. The least cost combination of resources refers to that bundle of resources which minimizes the total dollars of measurable inputs needed annually to obtain a given level of operator earnings. Measurable inputs are all factors of production except the services of management.

More specifically, the objective was to determine, subject to the restrictions indicated later, the farm organizations which minimize the total cost of the inputs required to provide four different levels of operator earnings—\$2,500, \$3,500, \$4,500, and \$5,500. The results of this study are not predictive estimates, but rather they indicate the farm organization feasible if the conditions assumed in this study are fulfilled.

Scope and Methods

A long-run planning situation was considered in which all resource services—land, labor, and capital—were vari-

able. The input-output coefficients for enterprise budgets were based on the use of advanced technology appropriate for the area's agricultural production.² The "projected" practices and yields incorporated in the budgets thus represented production practices being used and rates of production achieved by the better managers in the area.

Owner-operated farm units are assumed with a maximum of 2,500 hours of operator's labor available for farm use. A reservation price of \$1.08 per hour is charged for all operator's labor used. Operator's labor thus will not be used in the farm plan unless it earns at least \$1.08 per hour. Hired farm labor at \$1.21 per hour is available during April through October with exchange labor used during the peak periods of planting and harvesting.

The quantity of capital is unlimited at a cost of 5 percent for investment capital and 6 percent for operating capital. In order for the plans to qualify as corn or hog farms, it was required that 60 percent or more of the total farm sales come from the major enterprise on the corn farms and hog farms, respectively. The crop rotations are not restricted by government programs.

Prices used in this study were derived from U.S. 1959 average prices. The projected land price is based on the average market value of all land without buildings in the respective areas, and is \$380 per acre on the corn farms and \$276 on the hog farms. Solutions were obtained for these projected land prices and for values 10 percent above and 10 percent below.

Since a long-run planning situation is assumed in which all factors are variable, the buildings and machinery are those that best fit the technologies incorporated

² Enterprise budgets are available upon request to the author.

into the farms. Machinery and buildings are new.

Two basic sets of tractors and component machinery were considered. Set A — two-plow, two-row; and Set B — three-plow, four-row. Other equipment and machinery were available for use with either size of tractor. Custom-hired service was used for hay baling and harvesting corn silage and filling silos.

Linear-programming techniques were used to determine the least cost combination of enterprises to provide the specified incomes. Five crop rotations applicable to each of the type-of-farm areas were considered to include corn, soybeans, wheat, oats, and alfalfa-bromegrass hay. The four hog-production systems included two- and four-litter confinement systems and one- and two-litter pasture systems. Seven beef cattle programs were considered under two levels of mechanization. The beef cattle alternatives were: beef cow herd with calves sold at weaning; long-fed steer calves; long-fed heifer calves; light yearlings on pasture and drylot; long-fed yearlings; short-fed yearlings; and short-fed common to medium steers.

Corn Farm — Projected Land Price

The programmed farm organization for corn type farms on Drummer-Flanagan soils in east-central Illinois included corn, soybeans, and wheat (Table 2). No livestock were produced and the available permanent pasture land was not used.

The 1959 Census of Agriculture reported the average size of commercial farms in the area at 224 acres, which is between the land requirements for the two middle-income levels, \$3,500 and \$4,500 (Table 2). Total land requirements for the programmed corn farms ranged from 178 acres to 308 acres, crop land from 160 acres to 277 acres, corn

Table 2.—Resources Required for Specified Income Levels With Minimum Total Cost Requirements on Corn Farms, Projected Land Price, East-Central Illinois^a

	Labor and management incomes			
	\$2,500	\$3,500	\$4,500	\$5,500
Land use				
Corn.....	74	90	112	127
Soybeans.....	43	53	65	75
Wheat.....	43	52	65	75
Tillable acres.....	160	195	242	277
Total acres.....	178	217	269	308
Average investment				
Land.....	\$67,803	\$82,392	\$102,258	\$116,865
Farm machinery.....	6,993	7,138	8,695	8,843
Farm buildings.....	2,618	3,005	3,790	4,177
Crop inventory.....	5,556	6,751	8,379	9,576
Total.....	\$82,970	\$99,286	\$123,122	\$139,461
Farm costs				
Interest on investment.....	\$ 4,149	\$ 4,964	\$ 6,156	\$ 6,973
Depreciation.....	1,382	1,448	1,781	1,847
Taxes and insurance.....	1,109	1,324	1,642	1,857
Crop (seed, fertilizer, fuel).....	3,889	4,726	5,867	6,705
Other ^b	1,180	1,304	1,483	1,608
Total.....	\$11,709	\$13,766	\$16,929	\$18,990
Returns				
Total returns (corn, soybeans, wheat).....	\$14,209	\$17,266	\$21,429	\$24,490
Operator earnings per dollar of total returns.....	\$.18	\$.20	\$.21	\$.22
Operator earnings				
Labor and management.....	\$ 2,500	\$ 3,500	\$ 4,500	\$ 5,500
Hours worked.....	(1,084)	(1,317)	(1,270)	(1,451)
Labor at \$1.08 per hour.....	-1,171	-1,422	-1,372	-1,567
Returns to management.....	\$ 1,329	\$ 2,078	\$ 3,128	\$ 3,933

^a Set A—two-plow, two-row farm machinery—was adequate for the \$2,500 and \$3,500 incomes, but Set B—three-plow, four-row machinery—was required for the \$4,500 and \$5,500 incomes.

^bRepairs, interest on working capital at 6 percent and farm share of telephone, electricity, auto, and miscellaneous expenses.

from 74 acres to 127 acres, soybeans from 43 acres to 75 acres, and wheat from 43 acres to 75 acres. Two crop rotations were used, C-C-S-W and C-S-W. At all four income levels, corn accounted for 46 percent of the crop acreage with 27 percent of the acreage in soybeans and 27 percent in wheat.

Total investment, comprised largely of land, ranged from \$83,000 to \$139,500. Land accounted for 82 to 84 percent of the total investment. As the income target was raised to the higher levels, the investment required in land per dollar of income decreased from \$27 at the \$2,500 income level to \$21 at the \$5,500 income level. However, the cost of in-

vestment in land became increasingly important relative to the value of labor as the income goal was increased.

The changing needs for larger-capacity farm machinery and equipment as the farm size was increased are reflected in higher levels of capital investment in these items. The size of machinery was changed between the \$3,500 and \$4,500 incomes at about 200 acres of cropland. A two-plow, two-row set of tractor and equipment was adequate for the two smaller incomes, but a three-plow, four-row set was needed for the larger incomes because of the timeliness factor in plowing and planting.

Total farm costs, excluding the opera-

Table 3.—Resources Required for Specified Income Levels With Minimum Total Cost Requirements on Hog Farms, Projected Land Price, Western Illinois^a

	Labor and management incomes			
	\$2,500	\$3,500	\$4,500	\$5,500
Land use				
Corn.....	49	63	75	93
Soybeans.....	25	24	37	46
Wheat.....	25	31	37	46
Hay.....	14	16	20	24
Rotation pasture.....	10	7	18	22
Tillable acres.....	123	141	187	231
Total acres.....	162	186	246	304
Average investment				
Land.....	\$44,605	\$51,381	\$67,989	\$84,002
Farm machinery.....	7,985	8,154	9,023	10,640
Farm buildings.....	4,470	5,177	6,058	7,465
Fences, paving, water system.....	1,427	1,582	1,663	1,872
Livestock inventory.....	5,829	6,827	7,763	9,592
Crop inventory.....	2,685	3,349	4,298	5,311
Total.....	\$67,001	\$76,470	\$96,794	\$118,882
Farm costs				
Interest on investment.....	\$ 3,350	\$ 3,823	\$ 4,840	\$ 5,944
Depreciation.....	1,945	2,090	2,326	2,779
Taxes and insurance.....	884	1,011	1,278	1,568
Crops (seed, fertilizer, fuel).....	2,303	2,845	3,517	4,347
Livestock ^b	3,134	3,865	4,391	5,425
Other ^c	1,948	2,169	2,775	3,629
Total.....	\$13,564	\$15,803	\$19,127	\$23,692
Returns				
Corn.....	\$	\$	\$ 1,118	\$ 1,381
Soybeans.....	1,813	1,739	2,763	3,414
Wheat.....	1,218	1,560	1,857	2,294
Hogs.....	9,638	11,581	14,176	17,515
Beef cows and calves.....	2,274	2,153	3,713	4,588
Fat steers.....	1,121	2,270	.....	.....
Total returns.....	\$16,064	\$19,303	\$23,627	\$29,192
Operator earnings per dollar of total returns.....	\$.16	\$.18	\$.19	\$.19
Operator earnings				
Labor and management.....	\$ 2,500	\$ 3,500	\$ 4,500	\$ 5,500
Hours worked.....	(2,133)	(2,500)	(2,500)	(2,500)
Labor at \$1.08 per hour.....	-2,304	-2,700	-2,700	-2,700
Returns to management.....	\$ 196	\$ 800	\$ 1,800	\$ 2,800

^a A pasture, two-litter hog system was used on all farms. The beef cow herd was operated under low mechanization for the \$2,500 and \$3,500 incomes and high mechanization for the \$4,500 and \$5,500 incomes. Minimum costs were obtained by using a two-plow, two-row set of machinery for incomes \$2,500 through \$4,500 and a three-plow, four-row set for \$5,500 income.

^b Value of purchased livestock is deducted from both total costs and total returns.

^c Repairs, interest on working capital at 5 percent, hired labor, custom baling, farm sale, and farm share of telephone, electricity, auto, and miscellaneous expenses.

tor's labor and management, ranged from \$11,700 to \$19,000. The largest single item of costs was interest on investment, 35 to 37 percent of total costs. Fixed charges for interest on investment capital, depreciation, taxes, and insurance made up about 57 percent of all annual costs

at all income levels. Crop expense—seed, fertilizer, fuel—represented about a third of the annual costs with fertilizer accounting for about one-half of the crop expenses.

Total farm returns ranged from \$14,200 to \$24,500 for the four income

Table 4. — Number and Weight of Livestock Marketed for Specified Income Levels With Minimum Total Cost Requirements on Hog Farms, Projected Land Price, Western Illinois^a

Livestock	Labor and management incomes			
	\$2,500	\$3,500	\$4,500	\$5,500
Number of litters ^b	37	44	54	67
Barrows and gilts, 210 lb.				
Number.....	272	327	400	495
Weight.....	57,200	68,700	84,100	103,900
Sows, 500 lb.				
Number.....	18	22	27	34
Weight.....	9,200	11,100	13,600	16,800
Steer calves, good to choice, 400 lb.				
Number.....	11	10	17	22
Weight.....	4,300	4,100	7,000	8,600
Heifer calves, good to choice, 400 lb.				
Number.....	7	6	11	13
Weight.....	2,700	2,500	4,300	5,400
Beef cows, 1000 lb.				
Number.....	4	4	7	8
Weight.....	4,400	4,200	7,300	9,000
Fat steers, good to choice, 1110 lb.				
Number.....	8	16	..	..
Weight.....	8,900	18,100	..	..

^a The number and hundredweight of each type of livestock that were programmed for the specified incomes were rounded to the nearest whole number.

^b Two-litter system on pasture.

levels. The programmed farm organization for all income levels included the minimum proportions, 60 percent, of total returns from corn to meet the type of farm requirement. Sales of soybeans were second in importance with 24 percent of gross returns; wheat represented 16 percent of gross returns.

Operator labor and management earnings per dollar of total returns ranged from 18 cents at the \$2,500 income level to 22 cents at the \$5,500 income level. When the operator's labor is valued at regular hired labor wages, the returns to management, the residual, increase rapidly as the income target is moved from \$2,500 to higher levels. Calculated in this manner, the returns to management ranged from \$1,329 at the lowest income level to \$3,933 at the highest income level. The increasing reward to this input is comparable with the higher level of managerial ability required for larger farms.

Hog Farm — Projected Land Price

The programmed farm organization for hog type farms on Tama-Muscatine soils in western Illinois included corn, soybeans, hay, and rotation pasture (Table 3). A two-litter hog system on pasture and an enterprise of beef cows with calves sold at weaning were followed at all income levels. The number of litters of hogs ranged from 37 at \$2,500 to 67 at \$5,500 income (Table 4). The beef cow herd was operated under low mechanization methods for the \$2,500 and \$3,500 incomes and under high mechanization for \$4,500 and \$5,500 incomes. Small droves of long-fed steer calves, 8 to 16 head, were fed at the two smaller incomes using low mechanization methods of feed processing and distribution. Since it became necessary to hire labor at the \$4,500 and \$5,500 income levels, the beef feeding enterprise was dropped, and the additional income was obtained from the sale of corn and an

increase in the proportion of total returns from the beef cow herd.

The two beef cattle enterprises were supplementary at the \$2,500 income level, but the beef cow herd became competitive for labor at \$3,500 income, causing a slight reduction in the numbers. At the two higher incomes the fed cattle enterprise became competitive for labor and was discontinued. The beef cow herd, although operated under high mechanization at the two higher incomes, was competitive for labor but utilized permanent pasture that had no other use or cost to the farm.

The 1959 Census of Agriculture reported the average size of commercial farms in the area at 204 acres, which is between the land requirements for the two middle-income levels, \$3,500 and \$4,500 (Table 3). Total land requirements for the programmed hog farms ranged from 162 to 304 acres and cropland from 123 to 231 acres. A rotation of C-C-S-W-Cl was used at all incomes except \$3,500 where 20 percent of the cropland was operated under a C-C-W rotation. For the \$3,500 income, corn represented 45 percent of total crop acres; soybeans, 17 percent; wheat, 22 percent; hay, 11 percent; and rotation pasture, 5 percent. For the other three income levels, the proportion of total land in each crop was: corn, 40 percent; soybeans, 20 percent; wheat, 20 percent; hay, 10 to 12 percent; and rotation pasture, 8 to 10 percent.

Average investment ranged from \$67,000 for the \$2,500 income to \$118,900 for the \$5,500 income. This represents an investment of \$27 to \$22 per dollar of labor and management income, almost the same as for the corn farm. Land was the most important item of investment and increased in importance as the level of income was raised. Investment in land ranged from 66 to 71

percent of total investment for the four levels of income. Machinery, the second most important investment, declined from only 12 percent at \$2,500 income to 9 percent at \$5,500. The share of total investment of the other items of investment remained relatively stable as the income goal was increased—livestock inventory, 9 to 8 percent; farm buildings, 7 to 6 percent; crop inventory, 4 percent; and farm improvements of paving, fences, and water system, 2 percent.

Total farm costs increased from \$13,600 for the \$2,500 income to \$24,000 for the \$5,500 income.³ Interest on investment and livestock costs each represented about a fourth of total costs with crop costs accounting for slightly less than one-fifth of total costs. Hired labor requirements at \$1.21 per hour were 216 hours for the \$4,500 income and 571 hours for the \$5,500 income. Custom baling, another hired service was used at all income levels. The volume of hay produced was too small to justify the ownership of a baler.

Total farm returns ranged from \$16,100 to \$29,200 for the four income levels. Operator earnings per dollar of total returns increased only moderately as income increased—16 cents at \$2,500, compared with 19 cents at \$5,500. The programmed farm organization for all income levels included the minimum proportion, 60 percent, of total returns from hogs to meet the type of farm requirement. Thus the production of cattle at the two lower income levels and cattle and corn produced for sale at the higher income levels represent lower costs per dollar of labor and management income than additional production of hogs. Returns from fat steers were 7 percent of

³ The value of purchased livestock is deducted from both total costs and total returns because it does not represent production on these farms.

total returns at \$2,500 income and 12 percent at \$3,500 income. Corn sales were 5 percent of total returns at the two higher incomes. Returns from the beef cow herd — calves and cull cows — were 14 percent of total returns at \$2,500, 11 percent at \$3,500, and 16 percent at \$4,500 and \$5,500.

Total labor requirements ranged from 2,133 hours for the \$2,500 income to 3,071 for the \$5,500 income. The operator's labor, a maximum of 2,500 hours, was fully utilized at the three highest incomes with 216 hours of labor hired at the \$4,500 income and 571 at the \$5,500 income. With a charge of \$1.08 per hour for the operator's labor, the residual, returns to management, increased from \$196 at \$2,500 to \$2,800 at \$5,500.

Influence of a Change in Land Price

Corn farm. Land prices of 10 percent above and 10 percent below the projected land price were programmed to determine the effect on farm organization. At the lowest land price the farm organization remained the same as programmed for the projected land price except fewer acres of crops were needed to obtain comparable incomes. When the price of land was increased 10 percent above the projected land price, a single crop rotation, C-C-S-W, was selected that contained a higher proportion of corn. Returns from corn represented about 64 percent of total returns and thus exceeded the minimum percent of total returns from corn (60 percent) to meet the type of farm requirement.

Hog farm. As land price was increased, more resources in approximately

the same proportion as for the farm organizations at projected land price were required to obtain the specified income levels. The opposite pattern occurred with land values 10 percent below the projected land price.

Summary

The minimum amounts of resources necessary to achieve income levels of \$2,500, \$3,500, \$4,500, and \$5,500 were estimated for corn farms and hog farms. These farms were required to get at least 60 percent of their income from corn and hogs, respectively. A high level of management was assumed.

The minimum-resource corn farm for a \$2,500 income had 178 acres, while that for a \$5,500 income had 308 acres. Although livestock were considered as an alternative, they were not included in the minimum-resource plans. The optimum cropping system was not affected by the income level; it remained at 46 percent corn, 27 percent soybeans, and 27 percent wheat for the projected land price and for a land price of 10 percent lower. At a land price of 10 percent above the projected land value, the cropping system included a higher percentage of corn — 50 percent corn, 25 percent soybeans, and 25 percent wheat.

The minimum-resource hog farm for a \$2,500 income had 162 acres, and for a \$5,500 income, 304 acres. The number of litters ranged from 37 litters for a \$2,500 income to 67 litters for a \$5,500 income. With slight variation, the optimum rotation was C-C-S-W-Cl at all income levels and land prices.

Custom Work and the Farmer's Machinery-Investment Decision

NORMAN COWARD

IN RESPONSE TO CHANGES in farm size and resource costs, the level of mechanization has been increasing in Illinois and elsewhere, especially since World War II. It appears that many farmers cannot justify the use of capital to finance this investment in machinery; the situation frequently arises where the returns per dollar invested in other factors of production, such as fertilizer, livestock, or feed may be greater. Many farmers cannot justify on economic grounds the ownership of many machines because of their small acreage; 29 percent of the farms in Illinois are less than 100 acres in size, and a further 25 percent are less than 180 acres.

Custom work enables the farmer on a small unit to overcome some of these problems. He may either hire custom work or purchase a specialized machine for his own use and spread his ownership costs by performing custom work for others. If he can find sufficient outlet for his services, the latter method has many advantages to the farmer with limited acreage since it provides him with the opportunity to sell some of his own labor and the use of his other equipment, for example, the tractor which might pull a harvesting machine. If he hired custom work for himself, the farmer might be hiring additional labor and tractor services while his own remained idle, and frequently an economic problem on the small farm is an excessive supply of tractor and labor services due to the indivisibility of these factors.

Trends in Custom Work

A 1961 USDA survey showed that custom services account for about 20 per-

cent of the acreage covered in all harvesting operations, and that 6 to 7 percent of all fieldwork is custom-hired.¹ In Illinois, the extent of machinery hire appears to be decreasing, as shown by the following figures for the total value of machinery hire:

Year	Total value	Value per farm
1950.....	\$31,011,256	\$158.80
1954.....	\$25,630,916	\$146.00
1959.....	\$24,544,672	\$158.70

Source: U.S. Census of Agriculture 1950, 1954, 1959.

As more farms become equipped with particular machines, the total volume of custom work for farm operations declines. However, custom work is probably becoming increasingly important for jobs requiring specialized equipment like earth-moving, ditching, tiling, and terracing. Such work tends to be done by full-time commercial custom operators, while most custom work in growing and harvesting crops is done by full-time farmers.

Rates for Custom Work

From Table 1 it can be seen that overall custom rates increased by only 11 percent from 1947 to 1961. The rates for tillage operations increased by more than this while those for harvesting increased by less, and the rate for baling actually declined.

Over the same period, it was found that the costs of owning and operating machines on Illinois farms increased by 58 percent. This figure was calculated as an average, weighted by the number of farms of different types and in different size groups, from the 1947-1960 farm

¹ Farm Machinery: A Survey of Ownership and Custom Work, U.S. Dept. Agr. Stat. Bul. 279, March, 1961.

Table 1.—Custom Rates for Selected Operations and the Index of the Rates for 14 Operations, 1947-1961

	1947	1951	1955	1959	1961	Index 1961 (1947 = 100)
Spring plowing, per acre.....	\$2.71	\$3.02	\$3.19	\$3.49	\$3.68	136
Hay baling (twine), per bale.....	\$0.152	\$0.144	\$0.136	\$0.131	\$0.130	86
Corn picking, per acre.....	\$4.83	\$5.00	\$4.87	\$5.00	\$5.07	105
Combining wheat or barley, per acre.....	\$3.91	\$4.59	\$4.65	\$4.68	\$4.83	124
Index of 14 operations (1947 = 100).....	100	110	106	110	111	111

**Table 2.—Numbers and Percentage Increase in Numbers, 1950-1959,
Selected Farm Machines in Illinois**

Machine	1950	1954	1959	Percent increase 1950-1959
Grain combines.....	71,973	90,781	93,361	15.8
Corn pickers.....	75,556	99,588	105,542	39.6
Pick-up balers.....	15,762	29,916	38,797	146.1
Forage harvesters.....	....	12,263	15,513	....
Tractors.....	234,893	289,985	320,769	36.6

Source: U.S. Census of Agriculture 1950-59.

business analysis reports of the Illinois Farm Bureau Farm Management Service. Perhaps the most important reason for this discrepancy between the changes in custom rates and machinery costs is the large increase in the numbers of machines in Illinois (Table 2).

At the same time there has been little change in the acreage planted to crops. This has meant that there has been an increase in the number of actual and potential custom operators, with no increase in the amount of work to be done. The decrease in the average number of acres to be harvested by each machine in Illinois is as follows:

	1950	1959
Grain acreage per combine.....	70.9	68.9
Hay acreage per baler.....	130.9	53.6
Corn acreage per picker.....	116.7	92.3
Cropland acreage per tractor....	86.7	65.4

These figures assume that the entire acreages of hay, corn, and grain were harvested both in 1950 and 1959 by the machines mentioned. In fact, this may not accurately describe what happened. For example, some of the hay was harvested with a forage harvester in 1959,

whereas little if any hay would have been harvested by such a machine in 1950. However, the general reduction in acreage per machine is apparent.

Especially significant is the 146-percent increase in the number of balers — this increase may account for the reduction over the period in the custom rate for baling. Another factor which would contribute to a larger increase in machinery costs than in custom rates is the fact that a portion of the aggregated increase in machinery costs is attributable to the greater use of specialized livestock equipment, very little of which is available for use on a custom-hire basis, and much of which has been developed since 1947.

That there are now more farm machines to perform a similar quantity of work does not necessarily indicate that there has been a reduction in efficiency, since the greater number of machines allows more timeliness of operations and a better quality of product.

The price of custom work has fallen in part because of the competitive market

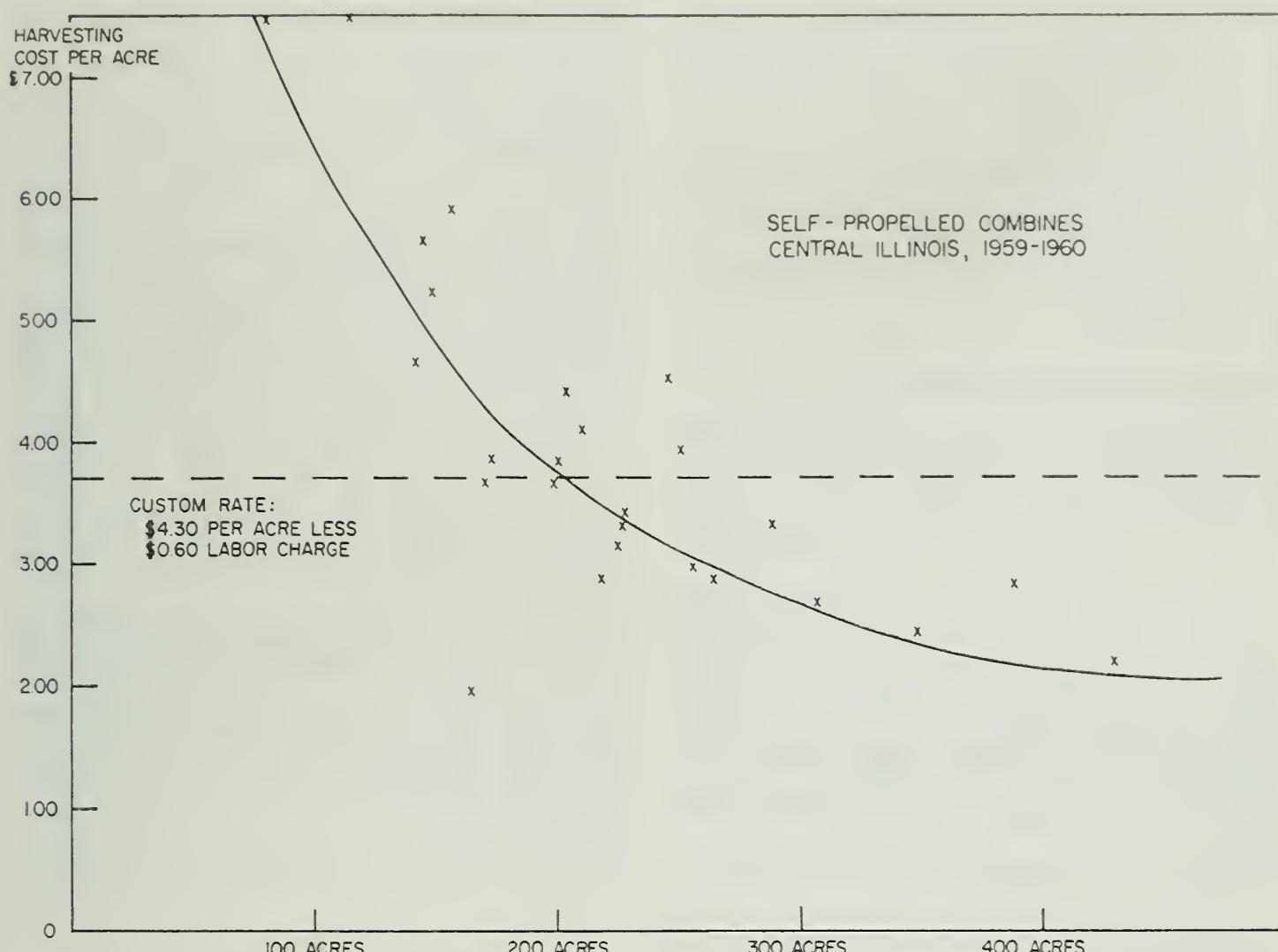


Fig. 1.—Cost per acre and annual use, self-propelled combines; average for 1959 and 1960.

with many buyers and sellers and in part because custom work done by farmers represents a marginal use of the machine, and the marginal cost of additional work for the machine is low.

Break-Even Analysis

Frequently the relationship between machine ownership and custom work is presented as a break-even graph, as in Figure 1. This curve was fitted by the least-squares method² from data provided by central Illinois farmers in 1959 and 1960.³ The custom rate shown is the

average for this area, \$4.30 per acre in 1959-1960, less a charge for labor of \$0.60 per acre to permit comparison with the machinery ownership costs that do not include labor.

Under these conditions, the break-even acreage below which it is considered uneconomical to own a combine is 200. However, it can be seen that there were a number of farmers who owned a combine but who harvested less than this acreage in these years at a cost per acre to them greater than the prevailing custom rate. For this reason it is suggested that factors other than the actual costs indicated in Figure 1 are considered by farmers before they decide to invest in a machine. These additional factors may include:

1. The opportunity cost of labor at harvest time.

² The equation of the curve is:

$$\log y' = 2.46 - 0.82 \log x$$

$r = 0.69$, statistically significant
at .01 level

³ Summary information appears in the *Detailed Cost Report for Central Illinois 1959-1960*, R. A. Hinton and A. G. Mueller, University of Illinois, Department of Agricultural Economics AERR-48, 1961.

2. Alternative possible uses of the necessary capital that may yield a higher return.
3. Timeliness.
4. Lack of skill on the farm for operating the machine.
5. Personal prestige of machine ownership.

Opportunity Cost of Labor

The opportunity cost of labor is relevant whether a farmer hires custom work or hires out his own labor services. It is the cost of the labor in terms of the best alternative use which is foregone. Thus its value will depend on the nature of the uses which exist for labor at harvest time. Figure 2 shows a method by which different values which might exist for labor may be incorporated into the break-

even analysis.⁴ It shows, for different values of labor and annual acreage, whether the ownership of a 7-foot combine with power take-off or a 10- or 12-foot self-propelled combine is justified where custom work is available at the different rates shown. Above and to the left of each solid line, it is more profitable to hire custom work at the rate indicated. Below and to the right, ownership of one of the machines is justified — which one will depend on the value of the coordinates relevant to the particular situation. For example, with the

⁴ The costs used to derive this figure are those recorded by cooperators in the detailed cost investigation in 1960 (see footnote 3). The estimated rates of performance are 1.65 acres per hour for the 7-foot P.T.O. combine, and 2.60 acres per hour for the 10- or 12-foot self-propelled combine.

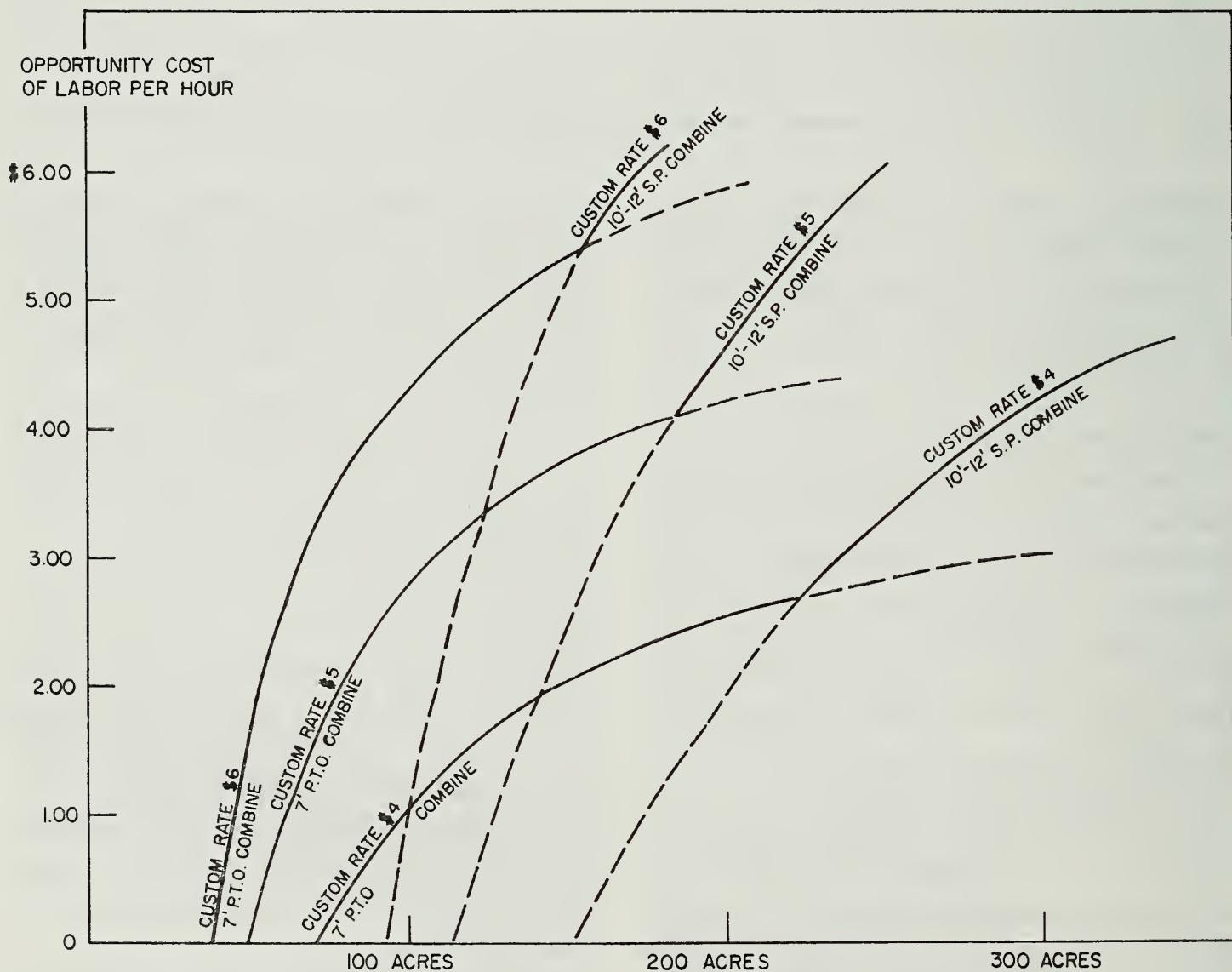


Fig. 2.—Influence of opportunity cost of labor on break-even acreages for custom work and machine ownership.

opportunity cost of labor at \$1.50 per hour, the break-even acreage between owning a 7-foot P.T.O. combine and hiring custom work at a local rate of \$5 per acre is 75 acres.

Alternative Uses of Capital

Ideally, capital is allocated among its possible alternative uses on the farm so that additional increments of capital yield the same return in each use. Where capital is more limiting then, it has a higher opportunity cost, as for labor. In Figure 3 the vertical axis shows the yield, in terms of an interest rate, which a farmer may be able to obtain in alternative uses of his capital.⁵

⁵ This graph is derived from the data in the detailed cost account records for 1960 (see footnote 3), in which the average acquisition cost was \$1,560 for the 7-foot P.T.O. combine and \$4,060 for the 10- and 12-foot self-propelled machines.

As the return on an alternative investment is greater, i.e., as capital becomes more expensive, the effective break-even acreage is greater. Machine ownership becomes more expensive than hiring custom work due to the greater interest rate to be charged on the machinery investment. Each line on the graph marks the break-even points between machine ownership and hiring custom work at the rates shown. To the left of each line it is more economical to hire custom work, and to the right, to own the machine.

Timeliness

Frequently the custom operator is unable to perform his clients' work at the optimum time, resulting in a reduced yield or quality of product. This factor is also taken into account when a farmer decides on the purchase of a machine.

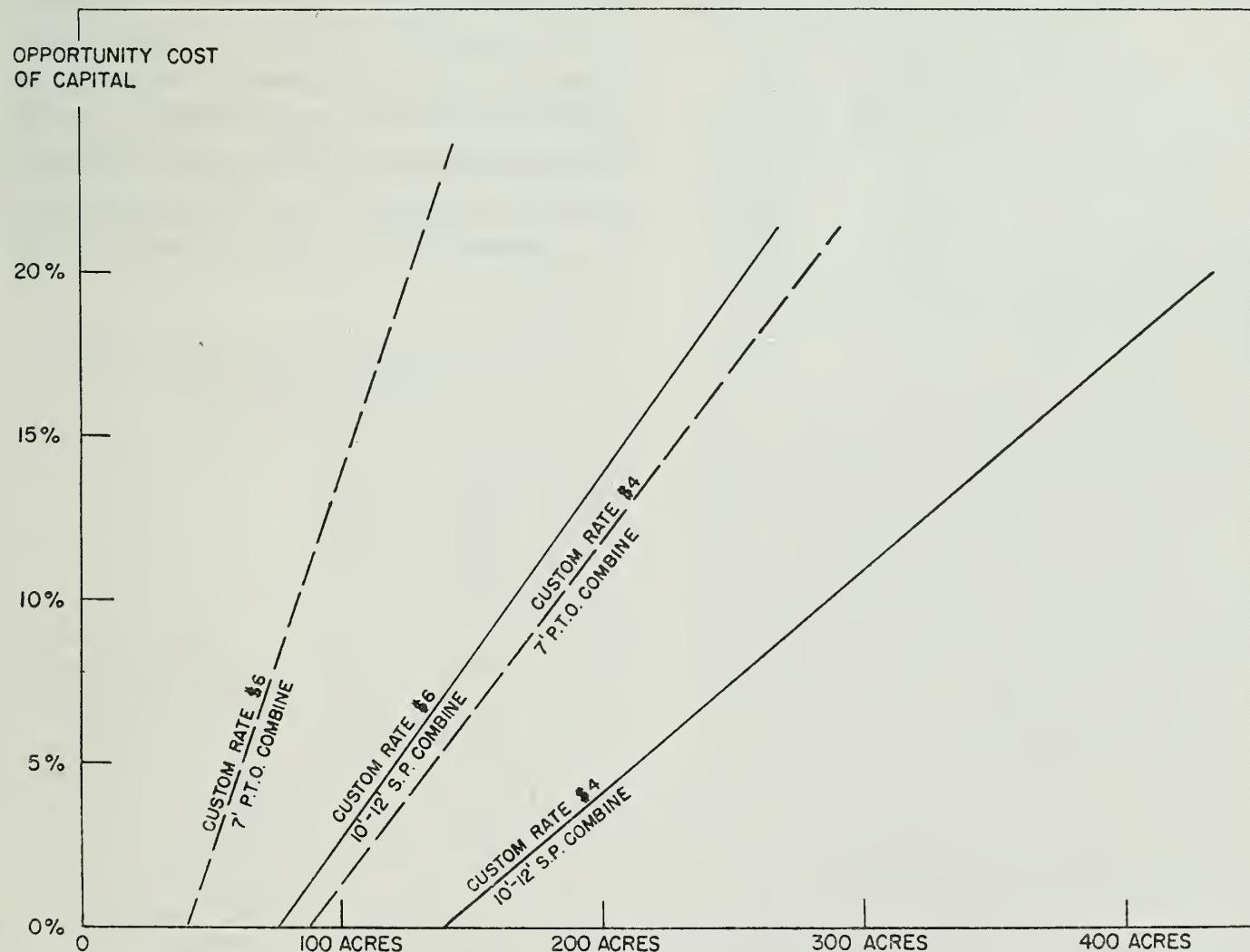


Fig. 3.—Influence of opportunity cost of capital on break-even acreages for custom work and machine ownership.

To evaluate timeliness in dollar terms is beyond the scope of this article; it requires that the loss incurred by a lack of timeliness be quantified and that a model be used which takes account of probable weather conditions and expected delays in the arrival of the custom operator.

Table 3 shows a possible way of summarizing this information of this type for hay baling in Illinois. The probability of rain damage, given certain delays, has been determined as an average of the years 1950-1959 for the months of June, July, and August. A value of unweathered hay of \$18 per ton was assumed, and the nutrient loss of the hay due to rain exposure was calculated from an earlier Connecticut survey. The final column of the table shows the effect

which different expected delays exert on the break-even point.

Lack of Skill on the Farm for Operating the Machine

This situation may, of course, be overcome by learning, and it may be partly offset by a poor quality in the work provided by the custom operator.

Personal Prestige of Machine Ownership

If this situation exists and if it influences a farmer's machinery investment decision, he is maximizing not profit but satisfaction directly, and the cost of doing this in terms of profit foregone can be calculated.

Conclusion

By considering only the conventional break-even analysis, it appears that a number of farmers cannot justify the machines they own. By considering, however, a number of other factors that enter into the investment decision, an analysis of broader scope may be made which sheds more light on this apparent economic irrationality and indicates how the conventional analysis needs to be modified.

Table 3.—Influence of a Calculable Delay in Baling on the Break-Even Point

Delay (days)	Probability of rain damage due to delays	Break- even point (bales)
0.....	0.00	3,800
1.....	0.11	3,320
2.....	0.19	2,980
3.....	0.25	2,580

Implications of the European Common Market for the United States

ROLAND W. BARTLETT

FROM A LONG-RUN VIEWPOINT the economic integration of Belgium, France, West Germany, Italy, Luxembourg, and the Netherlands into what is known as the European Common Market is one of the most important events since World War II. Business in the Common Market is prospering, and while there is still some unemployment in southern Italy, for the six countries as a whole, employment is very high. Between 1951 and 1960, at constant prices the gross national product (GNP) in the Common Market increased at an annual rate of 5.3 percent. As would be expected, the growth rate has slowed down in recent years. In 1963 the GNP growth rate was 4.3 percent, compared with a 3.8-percent growth rate for the United States. Some of the gloomy comments in recent months about the falling apart of the Common Market are not substantiated by the continued high level of employment and the GNP growth rate in these countries.

Table 1.—Comparisons Between the Common Market, the European Free Trade Area,^a and the United States

	Common Market	European Free Trade Area	United States
Population, 1960 (millions).....	170.0	90.1	182.3
Gross national product 1960 (billions of dollars).....	180.9	109.9	504.4
Average annual GNP growth rate, 1951 to 1960 (percent)...	5.3	3.2	3.2
Average annual indus- trial production growth rate, 1951 to 1960 (percent)...	7.4	3.6	3.3

^a Includes Austria, Denmark, Norway, Portugal, United Kingdom, Sweden, and Switzerland.

Integration in the Common Market not only eliminates all kinds of trade barriers, but also permits a free flow of labor, capital, and industrial know-how between the different countries. Growing pains are inevitable when such far-reaching changes take place within a given area and when these changes interact with the economic forces of other nations. The purpose of this article is to set forth some of the long-run implications of the European Common Market as related to the economy of the United States. Some bases of comparison are included in Table 1.

Common Market Imports From the United States Rise With Increase in GNP

Past evidence indicates that as the GNP of the Common Market countries increases, their total demand for U.S. products will probably increase. The GNP in the Common Market countries increased 43 percent from 1953 to 1961. In 1961, American exports to Common Market countries totaled \$3.6 billion, more than twice the volume in 1953 (\$1.6 billion). During this period the growth rate of imports of U.S. products into Common Market countries was faster than the GNP growth rate of these countries. A statistical study has shown that the net influence of each 10-percent increase in the average GNP in Common Market countries from 1950 to 1959 was a 16-percent increase in U.S. imports into these countries.¹

In a rapidly expanding economy such as that of the Common Market, both the

¹ From an unpublished study of Stephen C. Schmidt of the Department of Agricultural Economics, University of Illinois.

Table 2.—United States Exports to the Common Market; Selected Groups, 1959 to 1962^a

Product	1959	1960	1961	1962
<i>millions of dollars</i>				
Foodstuffs.....	488	438	587	674
Meat products.....	34	42	64	71
Grains and preparations.....	314	265	389	408
Wheat and wheat flour.....	53	54	180	56
Fruits, vegetables, and preparations.....	58	58	70	91
Vegetable oils and fats, refined.....	3	7	3	2
Inedible animal products.....	103	108	109	95
Hides and skins, raw, except furs.....	20	24	22	21
Animal and fish oils and greases.....	59	50	44	36
Inedible vegetable products.....	358	416	386	418
Rubber and manufactures.....	75	99	79	76
Synthetic rubber.....	66	84	63	58
Oilseeds and expressed oils.....	160	173	160	185
Tobacco and manufactures.....	98	107	118	127
Tobacco, unmanufactured.....	82	88	96	106
Machinery and vehicles.....	421	781	865	976
Machinery.....	339	500	713	790
Electrical apparatus.....	74	90	122	143
Household appliances.....	3	5	8	13
Radio, TV, and other electronic equipment.....	29	37	46	62
Industrial machinery.....	207	322	443	477
Power generating machinery.....	17	27	29	37
Construction, excavating, and mining.....	42	58	84	89
Metalworking machinery and machine tools.....	50	87	137	137
Textile, sewing, and shoe machinery.....	19	30	39	32
Other industrial machinery.....	78	120	154	182
Air conditioning and refrigerator equipment.....	10	15	15	19
Office machines and parts.....	32	53	92	116
Agricultural machines and implements.....	7	8	14	11
Tractors, parts and accessories.....	13	18	32	30
Automobiles, parts and accessories.....	38	57	61	68
Trucks, buses, and chassis, new.....	4	5	5	4
Passenger cars, new.....	19	31	31	33
Civilian aircraft.....	42	223	86	108
Railway transportation equipment.....	1	2	2	2
Chemicals and related products.....	285	369	384	390
Coal-tar products.....	32	63	78	68
Medicinal and pharmaceutical preparations.....	39	37	40	37
Agricultural chemicals, including fertilizers.....	11	16	17	26
Plastics and resin materials.....	68	76	74	77
Textile fibers and manufactures.....	194	422	345	225
Cotton, unmanufactured.....	108	317	238	112
Man-made fibers and yarns.....	20	36	33	34
Textile finished manufactures.....	28	33	43	41
Fabrics.....	17	19	26	22
Cotton cloth, including duck.....	2	4	4	5
Wearing apparel.....	7	8	9	10
Wood and paper.....	66	108	113	125
Sawmill products and wood manufactures.....	12	19	17	21
Pulp, paper, and products.....	51	81	89	93
Mineral fuels.....	228	231	223	260
Coal and related products.....	145	129	122	155
Petroleum and products.....	54	65	60	59
Metals and manufactures.....	174	456	386	299
Iron and steelmaking raw materials, chiefly scrap.....	14	58	73	42
Iron and steel-mill products.....	30	70	48	42
Nonferrous metals and ferroalloys, including scrap.....	110	296	227	174
Aluminum.....	20	66	36	39
Copper and copper-base alloys.....	66	183	141	104
Metal manufactures.....	18	27	32	41

(For footnotes see next page.)

Table 2. — Concluded

Product	1959	1960	1961	1962
<i>millions of dollars</i>				
Miscellaneous commodities.....	103	64	156	168
Photographic and projection goods.....	13	18	23	25
Scientific and professional instruments.....	14	16	21	27
Total.....	2,420	3,461	3,554	3,630

^a For 1959 and 1960, U.S. Department of Commerce, *United States Trade With Major World Areas, January-December 1961*, World Trade Information Service Statistical Reports, Part 3, No. 62-18, p. 2; for 1961 and 1962, U.S. Department of Commerce, *United States Trade With Major World Areas, January-December, 1962*, Overseas Business Reports, OBR-63-102, May 1963, p. 2. Because of omission of certain minor items, individual items do not always sum to the group totals in the table.

types and volumes of products needed change year by year. The volume of each of the important U.S. products exported to the Common Market each year from 1959 to 1962 is shown in Table 2 and the changes in types of exports are shown in Table 3.

Exports to the Common Market from the United States increased from a total of \$2,420 million in 1959 to a total of \$3,630 million in 1962, a net increase of 50 percent. Of 40 major items, the export volume in 1962 was higher than in 1959 for 37 and lower for three items. Relative changes in U.S. exports to the Common Market by groups of products are shown below (Tables 2 and 3).

U.S. foodstuffs. U.S. exports of grains, meats, fruits, and vegetables to the Common Market increased from \$488 million in 1959 to \$674 million in 1962, a net increase of 38 percent. From 1959 to 1962, however, the proportion of exported foodstuffs to total exports decreased from 20.2 percent to 18.6 percent.

Inedible animal and vegetable products. Exports of hides and skins, rubber, oilseeds, and tobacco increased from \$461 million in 1959 to \$513 million in 1962, a net increase of 11.1 percent. In 1959, inedible products were 19 percent of total exports; in 1962, 14.1 percent.

Machinery and vehicles. Exports of these products increased from \$421 million in 1959 to \$976 million in 1962,

a net increase of 132 percent. In 1959, they were 17.4 percent of total exports; in 1962, 26.9 percent.

Chemicals. These products, which included coal-tar products, medicinal and pharmaceutical preparations, agricultural chemicals, and plastic and resin materials, increased from \$285 million in 1959 to \$390 million in 1962, a net increase of 37 percent. In 1959, chemicals were 11.8 percent of total exports; in 1962, 10.7 percent.

Textiles and wood products. Textiles included cotton, synthetics, and manufactured goods, while wood products included sawmill products, pulp, and paper. In 1962, these totaled \$350 million, or 35 percent above those for 1959 (\$260 million). These were 10.7 percent

Table 3. — Changes in Types of U.S. Exports to the Common Market, 1959-1962^a

Product	Percent of total	
	1959	1962
Foodstuffs.....	20.2	18.6
Inedible animal and vegetable products.....	19.0	14.1
Machinery and vehicles.....	17.4	26.9
Chemicals.....	11.8	10.7
Textile fibers and wood products.....	10.7	9.6
Metals and manufactures....	7.2	8.2
Mineral fuels.....	9.4	7.2
Miscellaneous.....	4.3	4.6
Total exports (millions).....	\$2,420	\$3,630

^a For source, see Table 2.

of total exports in 1959 and 9.6 percent in 1962.

Mineral fuels. These products, which included coal and petroleum products, totaled \$260 million in 1962, or 14 percent above exports in 1959 (\$228 million). Coal and petroleum were 7.2 percent of total U.S. exports in 1962 as compared with 9.4 percent in 1959.

Metals and manufactures. U.S. exports of these products totaled \$299 million in 1962, or 72 percent above those in 1959 (\$174 million). In 1962, metals and manufactures were 8.2 percent of total exports, as compared with 7.2 percent in 1959.

Certain facts should be kept in mind in analyzing these changes. Although our exports to the Common Market were slightly less in 1958 and 1959 than in earlier years, the Common Market is now buying more of our products than it did when Marshall Plan funds were at their peak. This indicates the commercial demand for U.S. products to meet the needs of their rapidly expanding economies.

On the other hand, the full effect of external tariffs on products imported has not yet been felt. As the Common Market nears the 1970 date for completion of its economic integration, internal tariffs between the six member nations will go to zero, and all countries will apply the same external tariffs.

And finally, it is impossible to know at this time how much effect the Trade Expansion Act of 1962 will have in increasing trade. The purpose of this act was to give the President power to negotiate lower tariffs on certain products in return for tariff reductions by the Common Market. The Treaty of Rome made definite provision for the lowering of Common Market tariffs when this would be advantageous. Recent reports

indicate that tariffs probably will be reduced for some U.S. products in return for lowered tariffs on Common Market products sold to us. Important decisions are expected to take place at the next negotiations, tentatively scheduled to begin in March, 1964.

Diverse Effects of Common Market Policies

As the Common Market economy grows, its import requirements from the United States grow even faster. But one must also remember that under new rules of business, some products will be helped, others will not be affected much one way or the other, and other products will be hurt.

In essence, the question of international trade between friendly nations depends on relative unit costs of production, transportation, and distribution, plus tariffs or other trade barriers. A study of costs and competition (Table 4) showed that of 214 products studied, unit costs in the United States were lower on 44 percent of the items and about the same on 14 percent, while on 42 percent U.S. costs exceeded those of other countries. Of 45 products studied for the Common Market, EEC costs on about one-third were either higher or the same as those in the United States, while on two-thirds EEC costs were lower than U.S. costs.

The probable impact of the Common Market on U.S. exports was reported in a study in 1961 by the Chase Manhattan Bank.² The study indicated that some exports could be partly displaced by European products — machinery, electrical equipment, instruments, finished chemicals, wheat, animal fats and oils, and meats. Other products that might be af-

² From *The New European Market*, the Chase Manhattan Bank, New York, 1961.

Table 4.—United States and Foreign Production Costs Compared^a

Region	Number of products	Costs higher than in U.S.	Costs the same as in U.S.	Costs lower than in U.S.
<i>percent of products</i>				
Total unit costs				
All areas.....	214	44	14	42
United Kingdom.....	31	13	13	74
EEC.....	45	27	9	64
Latin America.....	62	58	11	31
Plant costs				
All areas.....	228	54	10	36
United Kingdom.....	33	27	18	55
EEC.....	52	35	8	57
Latin America.....	66	66	8	26

^a National Industrial Conference Board, *Costs and Competition*, 1961, p. 11, Table 2-A.

fected to a lesser extent included motor vehicles, iron and steel, corn and feed grains, tobacco, petroleum and products, and coal. Products that would be affected scarcely at all included aircraft, scrap metals, metal ores, basic chemicals, cotton, and soybeans.

The demand for our raw materials is likely to increase. Ores, textile fibers, nonmineral oils, and raw chemicals are likely to be little affected by tariff changes in the Common Market. At present, about 25 percent of U.S. exports to these countries are in this category. Industrial growth in Common Market countries is likely to increase imports of these products from the United States.

In contrast, demand for machinery, metal manufactures, electrical and transportation equipment, instruments, and finished chemicals is likely to decrease. Around 40 percent of all U.S. exports to the Common Market consists of these products. Because of the increasing industrialization and the accompanying external tariffs in the Common Market, many of our producers will find European competition difficult to meet, and some products now successfully exported to Europe may cease to move there. Also, our manufacturers will meet increasing

competition from Common Market countries in markets outside Europe. European countries must export goods in order to pay for imports of raw materials, and Common Market exports now exceed ours in total volume.

The overall effects of Common Market policies on a particular group of commodities, however, may be exactly opposite the effect on a specific commodity within the group. The United States can still produce many products cheaper than Common Market countries. The study by the Chase Manhattan Bank stated:

Experience shows that industrialized nations tend to exchange manufactured goods that are superficially the same. Steel comes in many thousands of shapes, sizes, and alloys. Machines are designed in such an infinite variety of models, styles, and specifications that it becomes virtually impossible for one country to produce all components best. For example, the United States both exports and imports textile machinery, electric motors, and a very large number of other finished goods, component parts, and accessories.

Production and sales of tabulating machines exemplifies the international nature of some products that are becoming increasingly important in a precision age. One U.S. company, operating on an

international basis, sells eight different models of tabulating machines. Seven of the eight are produced in the United States and one, a highly complicated machine with a "memory," is produced in West Germany. The eight models are available for sale throughout the United States and Europe. In a recent year the volume of our exports of machines was about three times the volume of "memory" machines imported.

Demand for U. S. Agricultural Products

As stated, 18.6 percent of our total exports to Common Market countries in 1962 were food (Table 3). As it progresses, Common Market agricultural policy will extend national preference to its own producers. This in turn will stimulate competition among Common Market farmers and encourage more efficient production of food within this area. The combined effect of these two factors may decrease total imports of agricultural products. Increased demand by Common Market countries for soybeans and oilseeds, inedible tallow and fats, and cotton may not fully offset decreased demand for meats (including broilers), wheat, and vegetable oils and lard. While dependent upon many varying factors, our exports of feed grains to the Common Market will probably be maintained at the present volume until the end of the 1960s.³

The changing situation in the Common Market, both desirable and undesirable for U.S. agricultural products, may be illustrated with soybeans and broilers. On the one hand, the Common Market countries need soybeans both for oils and for feed for their expanding economies.

³ For an analysis of the probable changes in U.S. agricultural exports to the Common Market see *Progress Toward the European Common Market in Agriculture*, by Stephen C. Schmidt, Department of Agricultural Economics, University of Illinois College of Agriculture, AERR-53, June, 1962.

U.S. soybean exports to Common Market countries increased from \$62 million in 1958 to \$122 million in 1961. Because of their need, the tariff on soybeans is zero. Sales of soybeans to the Common Market are likely to continue to increase. In November 1962, a U.S. Department of Agriculture marketing expert estimated that between 1962 and 1965 U.S. exports of soybeans could increase 40 percent and of soybean meal, 85 percent.⁴

In contrast to the soybean situation, increased Common Market tariffs are sharply curtailing imports of broilers from the United States. Most of the broilers consumed in the Common Market are produced at home (91 percent in 1962). By the use of mass volume methods this volume can easily be increased to meet the countries' total needs. Consequently, in furtherance of its policy of establishing target prices⁵ on some farm products in early 1962, the Common Market sharply increased its levies against imported chickens. This may be illustrated in Germany, the principal importing country, where levies were increased from less than 5 cents per pound in early 1962 to about 12½ cents in early 1963. By June, 1963, they had increased to 14.2 cents but were reduced to 13.5 cents in July.

As might be expected, Common Market imports of broilers have fallen off rapidly. From January to May, 1963,

⁴ U.S. Department of Agriculture Foreign Agricultural Circular FFO 10-62, November, 1962.

⁵ Prices to farmers for some agricultural products, such as broilers, have frequently been at a level above world prices and have varied within the different Common Market countries. The Common Market policy for such products is to establish a Common Market price, known as a target price, for each of such products. External levies are then established for imports that will cover the difference between world prices and Common Market target prices. These may vary from time to time in contrast to fixed tariffs as on products such as fruits, vegetables, and tobacco.

Common Market imports of U.S. broilers fell to 21 million pounds, or 40 percent of imports in the same months in 1962 (55 million). In 1962, the total value of U.S. broiler exports was \$46 million, of which \$30 million went to the Common Market. In 1963, the total value of U.S. broiler exports to the Common Market will be substantially less than in 1962, and is likely to continue at a lower level.

While reduced broiler exports from the United States to the Common Market will necessitate an adjustment in U.S. production, this is not a major catastrophe for U.S. broiler producers. In the peak year of 1962, the value of Common Market exports (\$30 million) was only 2½ percent of total U.S. broiler production (\$1.2 billion). The headlines in many U.S. papers have been out of all proportion to the economic consequences resulting from increased Common Market levies on broilers.

On balance, it appears probable that after the Common Market countries become fully integrated, the total of our food exports to these countries may be somewhat less than before they were economically integrated. On the more favorable side, as our industry is required to produce more goods for Common Market countries, increased jobs and payrolls to our industrial workers will tend to increase domestic demand for livestock products. Also, it is possible that some U.S. exports, such as feed grains, may be permitted on a permanent basis with zero or very low tariffs.

U. S. Investment in the Common Market

The development of the European Common Market with freer convertibility of currencies, more stable governments, and a common external tariff on many products has encouraged many of our large corporations to set up production

facilities in Europe. In 1950, U.S. firms had \$637 million invested in Common Market countries. By 1961 this had increased to over \$2,580 million.

Between 1958 and 1962, 1,298 American firms started new operations in Common Market countries, entered into joint ventures with European partners, or licensed manufacture of their products by a firm in these countries.⁶

<i>Industry</i>	<i>Number of firms</i>	<i>Percent of total</i>
Chemicals and products....	231	17.8
Nonelectrical machinery....	220	16.9
Electrical machinery and electronics.....	123	9.5
Basic metals and metal products.....	89	6.9
Instruments and watches....	77	5.9
Transportation equipment..	71	5.5
Food, beverages, and tobacco	69	5.3
Textiles and clothing.....	46	3.5
Petroleum and other fuels....	40	3.1
Other.....	332	25.6
Total.....	1,298	100.0

Experience in large-scale distribution and marketing and mass production techniques used in the United States are being absorbed in Europe along with investments. Although more than half of the American firms in Common Market countries are in manufacturing and about a third in petroleum production, new opportunities, such as in supermarkets and the manufacture of ready-made clothing, are opening up in these countries. Where operating costs are lower than in the United States, the establishment of a plant in Common Market countries allows an American firm the opportunity to compete on an equal footing with European producers and to protect its markets in other countries.

Although U.S. investment in all European countries, including those in the Common Market, is still less than 1 percent of that in the United States, unit profits made in European businesses have

⁶ Data obtained through the courtesy of Wolfgang Schoellkopf, European Economic Specialist, Chase Manhattan Bank.

tended to be higher than those in domestic markets and are strengthening the financial position of investing U.S. firms.

Pacesetters of Economic Growth

Between 1950 and 1959, according to information assembled by the Joint Economic Committee, the estimated GNP in the Western alliance increased from \$710 billion to \$1,013 billion in constant dollars, a net increase of 43 percent, or an average rate of 4 percent annually. In the Sino-Soviet bloc, the estimated GNP increased from \$216 billion in 1950 to \$411 billion in 1959, a net increase of 90 percent, or an average rate of 7.5 percent annually.

Common Market countries have had a high GNP growth rate in recent years. Between 1951 and 1960, Germany had the fastest GNP growth rate, 7.2 percent, followed by Italy, 5.8 percent, and the Netherlands, 5.1 percent. For all Common Market countries, the average was 5.3 percent. The growth rate of the OAS, SEATO, and the bilateral allies between 1950 and 1959 was 5 percent, or slightly under that of the Common Market countries. This compared with a growth rate of 3.2 percent for the United States.

In 1959 the purchasing power of the GNP in the Common Market countries averaged \$1,239 per person. At a growth rate of 5.3 percent, the annual increase averaged \$66 per person. In the United States, with a 1959 GNP of \$2,698 per person and an annual growth rate of 3.2 percent, the annual increase amounted to \$86 per person, slightly above that of the Common Market countries. As GNP increases, the GNP growth rate tends to decrease.

Common Market countries are now the pacesetters in business competition for all countries in the Western alliance, including the United States. As such,

these countries are helping the Western Alliance to attain an improved standard of living for its people as well as to maintain economic superiority over the Sino-Soviet bloc.

The Common Market and Balance of Payments to the United States

During the past few years, with its military and economic commitments overseas, and increased U.S. investment in the Common Market and other countries, the United States has had a dollar shortage in its international trade. Hence, one question is: What effect has trade of the United States with the Common Market had upon balance of payments?

From 1953 to 1962, U.S. exports totaled \$26.9 billion, or 59 percent more than imports from these countries (\$16.9 billion). In 1958, when the Common Market first came into being, U.S. exports totaled \$2.42 billion or \$890 million more than imports (\$1.53 billion). By 1962, U.S. exports to the Common Market had increased to \$3.63 billion or \$1.18 billion more than imports (\$2.45 billion).

During the period U.S. exports to the Common Market exceeded U.S. imports every year. Although the over-all balance of payments (which includes military expenditures, tourist expenses, etc.) has been unfavorable to the United States, there has been a favorable balance of trade with these countries in terms of the exchange of goods. The present level of GNP per person in the Common Market is about half that in the United States. Hence, with expansion in capital investment, freedom of trade barriers by 1970, and a free flow of labor and industrial know-how, it is probable that GNP in the Common Market will continue to increase. With this, one may expect a continued increase in U.S. exports to these countries.

Other Regional Economic Groups

With relative freedom from war and with pressures for improved standards of living, the world — including Common Market countries — is now in an industrial revolution which exceeds both in speed and in depth that of any comparable period in history. Furthermore, the philosophy for breaking down all types of trade barriers within a specific group of countries, initiated by Jean Monnet, Walter Halstein, Henri Spaak, and others, is gradually spreading to many different areas. Examples of this are:⁷

1. The Organization for Economic and Cooperative Development (OECD), formerly the Organization for European Cooperation, was founded in 1948 for the purpose of improving trade by breaking down trade barriers which have developed during the past century. This includes 15 European countries and the United States and Canada.

2. The Council for Mutual Economic Assistance (Comecon), consisting of Russia and its satellites, was organized in 1948. This organization has worked out long-term development plans to establish coordinated, planned socialistic economies in an area of 300 million people.

3. The European Free Trade Area (EFTA) consists of seven European countries not in the Common Market. Its purpose is to further trade between these countries through use of a loose federation. It was organized in 1959.

4. The Latin America Free Trade Area (LAFTA, 1960) consists of nine countries in Latin America whose ultimate goal is to merge their economies.

5. The Arab States are considering the establishment of a Common Market in western Asia. While political events have postponed this, the idea is being pursued by leaders in this area.

6. Central America, including five countries, set up a regional agreement in 1960 in an effort to coordinate their exports of agricultural products.

7. While still in the nebulous state, several young African nations are considering plans for closer economic co-operation. Among those who are proposing economic cooperation are Kenya, Uganda, Tanganyika, and possibly others.

For some areas, economic cooperation even of a token type for many years will be a long way from the complete economic integration agreed upon in the Treaty of Rome by Common Market countries. Both from a world viewpoint and from the viewpoint of the United States, however, the breaking down of trade barriers means a broader application of the law of comparative advantage and an increase in world trade. As world trade increases, the United States is in a position to benefit by it.

Merchandise trade between the United States and important areas in the world, including Western Europe, is shown in Table 5. In 1962, 77 percent of U.S. exports went to Canada, the Common Market, Latin American countries, and Asia. Total commercial exports (\$19.5 billion) in 1962 were about 4 percent of our national income. Approximately 4 million people were employed in producing and transporting these exports.

Probable Changes

While there will be painful adjustments for some products, one of the most important over-all results of the Common Market for the United States is its increased demand for U.S. products. Increased U.S. exports mean more U.S. jobs. Based upon the increase in U.S. exports to the Common Market combined with the expansion of U.S. exports to other areas during the past decade, it is not unreasonable to believe that during

⁷ Part of this material was assembled in 1961 by Piet Van Waeyenberge, Assistant in Agricultural Economics, University of Illinois.

Table 5. — U.S. Merchandise Trade, by Area

Area	Exports, including re-exports		General imports	
	1961	1962	1961	1962
Total, excluding military grant-aid exports ^a	20,152	20,901	14,713	16,397
Western Europe.....	6,867	7,317	4,058	4,542
Total, excluding special category exports ^b	19,143	19,474	14,713	16,397
Canada.....	3,643	3,830	3,270	3,657
Western Europe.....	6,287	6,371	4,058	4,542
European Economic Community.....	3,554	3,630	2,226	2,449
United Kingdom.....	1,130	1,075	898	1,005
Other.....	1,603	1,666	934	1,088
Japan.....	1,739	1,414	1,055	1,358
Latin American republics.....	3,415	3,222	3,213	3,394
Asia, excluding Japan ^c	2,535	2,944	1,563	1,633
Australia and Oceania.....	403	469	320	440
Africa ^c	669	746	636	733

^a Military grant-aid exports are reported only in total and for Western Europe.

^b Special category exports include military equipment and certain other items not reported by country.

^c U.A.R. (Egypt) included with Asia, excluded from Africa.

Source: Basic data of the Bureau of the Census. Table published by U.S. Department of Commerce Weekly, May 6, 1963, p. 4, Table 2. Because of the omission of certain minor items, the sum of exports of individual countries does not equal total exports shown.

the next decade an additional 2 million workers will be needed in the United States to produce and transport goods for the export market.

Though temporarily halted, eventual integration of the United Kingdom and other countries of the European Free Trade Area into the Common Market, either as members or associate members, is probable. Application of the law of comparative advantage to all or most of the countries in Western Europe will make possible an economy that will rank in output with those of the United States and Soviet Russia. Broadening the Common Market to include other European countries will help to increase further

the over-all market for American products.

As GNP in European countries increases, this will make it possible for them to assume a larger share of costs both for military defense and for the development of underdeveloped nations.

Finally, with a century in retrospect during which France and Germany engaged in three major wars, economic integration of these and other countries in Europe has indefinitely postponed or permanently averted the possibility of another war between these countries. This is of major importance to the United States because of our military commitments in Europe.

Agriculture and the European Common Market

STEPHEN C. SCHMIDT

THE EUROPEAN ECONOMIC COMMUNITY (EEC or European Common Market) is rapidly developing into an economic and political entity whose power nearly equals that of the United States. The realization of this centuries-old aspiration will probably change the pattern of world trade. An aspect of this process of immediate concern to food export countries is the perceptible drift toward self-sufficiency, including agricultural protectionism. The idea of such autarchy has recently been espoused by French President de Gaulle at his July 29, 1963, press conference when he stated that it is not worth talking of the European Economic Community unless it is understood that it obtains its food essentially from its own member countries.

As presently conceived, the common agricultural policy of the EEC is expected to confer a competitive advantage on internally produced commodities which, among other things, will tend to shift the burden of trade adjustment to outside countries. This article is an appraisal of the probable impact of developments in EEC on the export of American cereals, meats, fats, and oils to that region.

Pattern and Structure of Agricultural Imports 1951-1961

In 1961, Common Market countries accounted for one-fifth of total agricultural exports of the United States and roughly for one-third of dollar sales. As shown in Table 1, the commodity composition of EEC imports has shifted in the last decade in the direction of feeds, oilseeds, animal oils and fats, and fresh meats and away from wheat and flour.

Wheat of U.S. origin represented 17 and 37 percent of EEC imports in 1960 and 1961 compared with 53 percent in 1951. Except for the upsurge experienced in 1961, due to generally poor harvests, imports from the United States steadily contracted. Among member countries, Germany, Italy and the Netherlands were the best customers. The great variability in EEC wheat imports reflects (a) a rise in the degree of self-sufficiency and an improvement in dietary standards, (b) changes in the volume and quality of indigenous supplies,¹ (c) relative supplies in the major competing export countries such as Canada, Australia, and Argentina, (d) the low price and income elasticity of demand for cereal products, and (e) the relationship of wheat to feed grain prices.

Taking all feed grains together, the United States supplied over 40 percent of the Common Market's imports in recent years. Among feed grains, corn with a value of 123 million dollars in 1961 was most important followed by miscellaneous cereals (SITC group 045) and barley. Imports of U.S.-grown corn and barley have increased over those recorded in 1951. However, in terms of relative share of the market only barley achieved gains. Thus while the share of U.S. corn in EEC imports declined from 61 percent in 1951 to 44 percent in 1961 that of barley increased from 2 to 14 percent. The position of miscellaneous cereals in EEC imports provides an interesting contrast. Owing to an overall fall in imports including those from the

¹ Quality changes may alter the use pattern of wheat which in 1960-61 was as follows: 66 percent as food, 27 percent as feed, and 7 percent as seed.

United States, the U.S. share during the 1951-1961 period actually rose from 47 to 50 percent. The experience of processed feeds (SITC group 081) resembles that of barley. U.S. shipments were modest until 1954 but greatly expanded thereafter. In consequence, the U.S. share rose from 5 percent in 1951 to 8 percent in 1961.

Apart from changes in the market position of individual U.S. feed grains, the most striking aspect of import transactions has been their high degree of variability. This as well as the generally strong demand for U.S. feed grains might be attributed to (a) expansion of livestock production, (b) availability and quality of internal as well as third-country feed supplies, (c) use disposition of surplus soft or low-grade wheat,² and (d) strong international financial position as manifested by the rising gold and dollar holdings of member countries. At present the Netherlands ranks first, Germany second, and Belgium third among

² In 1950-51 wheat fed to livestock averaged 1.1 million tons as against 5.1 million tons in 1958-1960. This was equivalent to 6 and 19 percent of EEC's wheat output, respectively.

Common Market importers of feed grains.

An originally small but rapidly increasing share of EEC's rice imports came from the United States. Thus in 1961 U.S. shipments amounting to 11 million dollars provided 31 percent of EEC total rice imports. At the same time imports from Eastern Europe expanded markedly and those from Asia dropped. Imports from the United States were stimulated by two circumstances: First, none of the member countries except France and Italy produced rice; and second, there was a shift in consumer preferences toward long-grain quality rice, a type which is not produced in the EEC. Currently Germany is the largest purchaser of rice, obtaining nearly half of its imports from the United States.

Meat and meat products did not bulk large in our trade with EEC during the 1950s. There were some exceptions. From a negligible 3 million dollars in 1951, shipments of fresh meats increased to 54 million dollars by 1961 and were the largest on record. Consequently the U.S. share in EEC imports increased from 3 to 16 percent. The largest items

Table 1.—Area Distribution of EEC Agricultural Imports in Millions of Dollars, 1951, 1960, and 1961
(percentages of total EEC imports are in parentheses)^a

Year	OEEC member countries			United States	Canada	Latin America	Asia	Eastern Europe	Intra-EEC
	Continental	Sterling	Total						
Wheat and Spelt (including meslin), Unmilled (SITC Group 041)									
1951.....	24 (4%)	..	24 (4%)	299 (53%)	94 (17%)	66 (12%)	1 (..)	22 (4%)	20 (4%)
1960.....	38 (14%)	..	38 (14%)	45 (17%)	113 (42%)	29 (11%)	1 (..)	26 (11%)	32 (12%)
1961.....	43 (9%)	3 (1%)	46 (9%)	185 (37%)	155 (31%)	23 (5%)	1 (..)	40 (8%)	34 (7%)
Meal and Flour of Wheat and Spelt (including meslin) (SITC Group 046)									
1951.....	3 (5%)	..	3 (5%)	18 (31%)	4 (7%)	1 (2%)	..	1 (2%)	3 (5%)
1960.....	13 (38%)	..	13 (38%)	8 (24%)	..	..	..	..	13 (38%)
1961.....	6 (30%)	..	6 (30%)	6 (30%)	..	..	..	..	6 (30%)
Maize (Corn), Unmilled (SITC Group 044)									
1951.....	2 (1%)	..	2 (1%)	89 (61%)	1 (1%)	26 (18%)	12 (8%)	4 (3%)	1 (1%)
1960.....	4 (2%)	..	4 (2%)	87 (33%)	1 (..)	142 (53%)	1 (..)	3 (1%)	4 (2%)
1961.....	23 (8%)	..	23 (8%)	123 (44%)	..	83 (30%)	..	21 (8%)	22 (8%)
Cereals, Unmilled, Other Than Wheat, Rice, Barley, and Maize (SITC Group 045)									
1951.....	4 (3%)	..	4 (3%)	63 (47%)	17 (13%)	24 (18%)	3 (2%)	13 (10%)	1 (1%)
1960.....	13 (8%)	2 (1%)	15 (9%)	88 (54%)	3 (2%)	27 (17%)	2 (1%)	10 (6%)	10 (6%)
1961.....	18 (15%)	..	18 (15%)	61 (50%)	3 (2%)	16 (13%)	..	7 (6%)	12 (10%)

^a Percentages do not add to 100 because of incomplete coverage of sources of imports.
Two dots (..) refer to imports of less than one-half million dollars or less than 0.5 percent.

Table 1. — Concluded^a

Year	OEEC member countries			United States	Canada	Latin America	Asia	Eastern Europe	Intra-EEC
	Continental	Sterling	Total						
Barley, Unmilled (SITC Group 043)									
1951.....	13 (13%)	..	13 (13%)	2 (2%)	21 (22%)	12 (12%)	1 (1%)	2 (2%)	1 (1%)
1960.....	33 (21%)	19 (12%)	51 (33%)	45 (29%)	6 (4%)	16 (10%)	..	9 (6%)	26 (17%)
1961.....	59 (50%)	10 (8%)	69 (58%)	17 (14%)	..	5 (4%)	..	16 (14%)	55 (47%)
Feeding Stuff for Animals (not including unmilled cereals) (SITC Group 081)									
1951.....	26 (32%)	3 (4%)	29 (36%)	4 (5%)	1 (1%)	27 (33%)	3 (4%)	..	7 (9%)
1960.....	74 (27%)	5 (2%)	79 (28%)	30 (11%)	1 (..)	97 (35%)	19 (7%)	8 (3%)	60 (22%)
1961.....	83 (29%)	4 (1%)	87 (30%)	24 (8%)	1 (..)	109 (38%)	11 (4%)	10 (3%)	69 (24%)
Rice (SITC Group 042)									
1951.....	19 (43%)	..	19 (43%)	..	..	2 (5%)	17 (39%)	1 (2%)	18 (41%)
1960.....	6 (15%)	..	6 (15%)	7 (17%)	..	..	17 (41%)	1 (2%)	5 (12%)
1961.....	5 (14%)	..	5 (14%)	11 (31%)	..	4 (11%)	8 (22%)	..	4 (11%)
Meat: Fresh, Chilled, or Frozen (SITC Group 011)									
1951.....	51 (55%)	1 (1%)	52 (56%)	3 (3%)	..	29 (31%)	..	4 (4%)	19 (20%)
1960.....	224 (63%)	4 (1%)	229 (64%)	38 (11%)	..	43 (12%)	1 (..)	26 (7%)	148 (41%)
1961.....	189 (57%)	5 (1%)	194 (58%)	54 (16%)	..	37 (11%)	..	26 (8%)	185 (56%)
Meat: Dried, Salted, Smoked, or Cooked, Not Canned (SITC Group 012)									
1951.....	8 (67%)	..	8 (67%)	2 (17%)	..	1 (8%)	..	..	5 (42%)
1960.....	3 (43%)	..	3 (43%)	..	..	2 (29%)	..	..	3 (43%)
1961.....	2 (40%)	..	2 (40%)	..	..	2 (40%)	..	..	2 (40%)
Meat: Canned and Meat Preparations, Canned and Not Canned (SITC Group 013)									
1951.....	14 (44%)	2 (6%)	16 (50%)	3 (9%)	..	6 (19%)	3 (9%)	1 (3%)	7 (22%)
1960.....	29 (39%)	2 (3%)	31 (41%)	4 (5%)	1 (1%)	13 (17%)	10 (13%)	8 (11%)	18 (24%)
1961.....	14 (32%)	1 (2%)	15 (34%)	2 (5%)	..	14 (32%)	..	6 (14%)	12 (27%)
Milk and Cream; Evaporated, Condensed, or Dried (SITC Group 022)									
1951.....	14 (100%)	..	14 (100%)	..	..	..	..	..	—b (—b)
1960.....	26 (90%)	..	26 (90%)	1 (4%)	1 (4%)	..	..	..	20 (69%)
1961.....	24 (89%)	1 (4%)	25 (93%)	..	1 (4%)	..	..	..	18 (67%)
Butter (SITC Group 023)									
1951.....	71 (79%)	..	71 (79%)	1 (1%)	..	8 (9%)	..	3 (3%)	36 (40%)
1960.....	36 (55%)	..	36 (55%)	3 (5%)	..	5 (8%)	..	3 (6%)	28 (42%)
1961.....	32 (89%)	..	32 (89%)	..	..	..	..	2 (6%)	20 (56%)
Cheese and Curd (SITC Group 024)									
1951.....	57 (89%)	..	57 (89%)	1 (2%)	..	..	..	..	32 (50%)
1960.....	120 (94%)	..	120 (94%)	..	..	..	..	1 (1%)	64 (50%)
1961.....	130 (95%)	..	130 (95%)	..	..	..	..	..	69 (50%)
Margarine and Shortenings (SITC Group 091)									
1951.....	15 (54%)	..	15 (54%)	11 (39%)	..	1 (4%)	..	..	10 (36%)
1960.....	8 (80%)	..	8 (80%)	2 (20%)	..	..	..	..	7 (70%)
1961.....	9 (41%)	..	9 (41%)	13 (55%)	..	..	..	1 (5%)	8 (36%)
Eggs (SITC Group 025)									
1951.....	70 (82%)	..	70 (82%)	1 (1%)	..	2 (2%)	7 (8%)	47 (55%)	47 (55%)
1960.....	149 (68%)	..	149 (68%)	4 (2%)	1 (..)	9 (4%)	13 (6%)	29 (13%)	115 (53%)
1961.....	140 (65%)	..	140 (65%)	4 (1%)	..	6 (2%)	11 (3%)	38 (10%)	113 (30%)
Oil Seeds, Oil Nuts, and Oil Kernels (SITC Group 221)									
1951.....	24 (5%)	..	24 (5%)	34 (7%)	7 (1%)	29 (6%)	216 (44%)	1 (..)	—b (—b)
1960.....	10 (2%)	1 (..)	11 (2%)	150 (26%)	17 (3%)	8 (1%)	137 (24%)	10 (2%)	4 (1%)
1961.....	9 (2%)	..	9 (2%)	161 (29%)	18 (3%)	21 (4%)	94 (17%)	16 (3%)	6 (1%)
Vegetable Oils (SITC Group 412) ^b									
1951.....	55 (16%)	2 (1%)	57 (17%)	41 (12%)	1 (..)	50 (15%)	48 (14%)	4 (1%)	—b (—b)
1960.....	89 (26%)	1 (..)	90 (26%)	49 (14%)	..	43 (12%)	29 (8%)	7 (2%)	25 (7%)
1961.....	68 (22%)	1 (..)	69 (22%)	26 (7%)	..	56 (18%)	21 (7%)	11 (4%)	22 (6%)
Animal Oils and Fats (SITC Group 411)									
1951.....	42 (42%)	11 (11%)	53 (52%)	25 (25%)	2 (2%)	7 (7%)	1 (1%)	..	—b (—b)
1960.....	25 (22%)	2 (2%)	27 (24%)	55 (49%)	1 (1%)	5 (5%)	10 (9%)	4 (4%)	10 (9%)
1961.....	33 (32%)	1 (1%)	34 (32%)	36 (32%)	..	11 (11%)	13 (13%)	..	17 (16%)
Oils and Fats, Processed, and Waxes of Animal and Vegetable Origin (SITC Group 413) ^d									
1951.....	15 (58%)	1 (4%)	16 (62%)	4 (15%)	..	2 (8%)	..	..	—b (—b)
1960.....	19 (68%)	1 (4%)	20 (71%)	2 (7%)	..	4 (14%)	1 (4%)	..	13 (46%)
1961.....	14 (61%)	1 (4%)	15 (65%)	2 (9%)	..	4 (17%)	1 (4%)	..	10 (42%)
Hides and Skins (Except Fur Skins), Undressed (SITC Group 211)									
1951.....	22 (12%)	3 (2%)	25 (13%)	2 (1%)	..	55 (29%)	10 (5%)	..	—b (—b)
1960.....	78 (27%)	6 (2%)	84 (29%)	18 (6%)	4 (1%)	37 (13%)	12 (4%)	3 (1%)	50 (18%)
1961.....	80 (27%)	9 (3%)	88 (30%)	22 (8%)	4 (1%)	38 (13%)	15 (5%)	3 (1%)	55 (19%)
Tobacco, Unmanufactured (SITC Group 121)									
1951.....	29 (22%)	1 (1%)	30 (23%)	57 (43%)	..	12 (9%)	14 (11%)	1 (1%)	5 (4%)
1960.....	60 (26%)	..	60 (26%)	84 (37%)	1 (..)	15 (7%)	24 (10%)	8 (3%)	21 (9%)
1961.....	72 (29%)	..	72 (29%)	86 (35%)	1 (..)	18 (7%)	22 (9%)	8 (3%)	35 (14%)

^a Percentages do not add to 100 because of incomplete coverage of sources of imports.^b Data not available.^c This group was assigned code number 421-422 in 1961.^d This group was assigned code number 431 in 1961.

Source: OEEC, Statistical Bulletin, Foreign Trade Series IV and C.

Two dots (..) refer to imports of less than one-half million dollars or less than 0.5 percent.

in this group were poultry and variety meats, which include livers, kidneys, tongues, and edible offal. By contrast the dollar volume of both canned and dried, salted, cooked, or smoked meats has been small and has tended to decrease. The principal competitors in fresh and processed meats outside EEC are Latin America, Eastern Europe, and Oceania. The pattern of imports from the United States reflects (a) shift from low- to higher-quality meat products as a result of rising personal incomes, (b) change in the degree of self-sufficiency, (c) availability of ample U.S. supplies at competitive prices, (d) volume and price of exportable surpluses in other meat-producing areas, and (e) imports liberalization before the variable levy system started.

The outstanding feature of EEC's dairy product imports has been their concentration on intra-regional and other continental Western European sources of supply.³ In 1961 member countries supplied 67 percent of milk, 56 percent of butter, and 50 percent of cheese import requirements.⁴ Other continental Western European countries supplied 22, 33, and 45 percent, respectively. Except for meeting temporary shortages, EEC imports of dairy products from the United States were nonsignificant in the 1950s.

Imports of margarine and shortenings had been relatively small and declining until 1960 but more than doubled in value in 1961. Since the demand for butter responds to price variations, it may well be that the spurt in imports is partly a reflection of the substitution of margarine for butter. About 55 percent of total imports in 1961 came from the

United States, 36 percent from within the EEC, and the remainder from other Western European and Eastern European countries.

As in the case of dairy products, imports of eggs were largely confined to Western European sources (65 percent). EEC member countries accounted for 30 percent of egg imports in 1961. U.S. shipments were valued at 4 million dollars in 1961, with 1 percent of total imports. EEC provides thus only a marginal outlet for U.S. eggs.

The phenomenal rise in oilseed shipments to EEC lifted these commodities to a position where they became one of America's leading agricultural exports after wheat. Their value was 161 million dollars in 1961 compared with 34 million dollars in 1951. As a result the share of U.S. oilseeds in EEC imports increased from 7 to 29 percent. Although not indicated in Table 1, the associated countries in Africa stand out as the most important external source of supply. In contrast, the share of Asia, formerly the dominant source of imports, declined from 44 to 17 percent during the 1951-1961 period. Primarily because of climatic conditions, the Common Market countries have traditionally been net importers of oilseeds and oilseed products and of vegetable oils.

The rise in demand for animal fats and oils has been partly met by an increase in the domestic production of butter and by slaughter fats. By types of products, a small and diminishing share of vegetable oils and processed oils and fats is covered by imports from the United States, whereas in animal oils and fats moderate gains were realized. It should be recognized, however, that imports of U.S. animal oils and fats reached their peak in 1956 and have decreased since then as a result of expansion in domestic production. Altogether

³ For a discussion on the present and prospective dairy surplus problems, see FAO, "Means of Adjustment of Dairy Supply and Demand," CCP 62/17/2, Rome, March, 1962.

⁴ France achieved a net export surplus in butter by 1957-1959 and Belgium by 1960-61.

EEC provides an outlet for about half of U.S. cottonseed oil exports and for one-third of U.S. soybean exports. Germany and the Netherlands represent the principal customers of U.S. soybeans. Imports of both animal and vegetable oils and fats from the United States displayed a high degree of volatility reflecting mainly (a) changes in the degree of self-sufficiency, (b) availability of exportable surpluses in competing countries such as Chinese soybeans, African peanut and palm oils, Philippine copra and coconut oils, and Canadian flaxseed and rapeseed, (c) increased use of inedible tallow and fats in feed mixtures, (d) shift from tallow-based soaps to chemical detergents, and (e) shift to low-fat diets with unsaturated vegetable oils.

Common Market imports of hides and skins from the United States expanded appreciably during the 1951-1961 period. From a mere 2 million dollars they climbed to 22 million dollars and accounted for around 8 percent of total imports. This expansion was conditioned by large U.S. supplies at attractive prices. Among other areas, Oceania and Latin America stand out as the major external source of imports.

Notwithstanding a 29 million dollar gain in terms of value, the U.S. share in EEC unmanufactured tobacco imports declined from a high of 43 percent in 1951 to 35 percent in 1961. Imports originating in Asia and Latin America also declined. Increased consumption of high-quality leaf tobaccos and a marked shift in concentration of imports from member countries themselves and from the associated overseas countries in Africa accompanied the decline.

The Common Agricultural Policy

The specific objectives of the common agricultural policy as set forth in Article 39 of the Treaty of Rome are as fol-

lows:⁵ (a) to increase agricultural productivity by developing technical progress and by ensuring the rational development of agricultural production and the optimum utilization of the factors of production, particularly labor; (b) to ensure thereby a fair standard of living for the agricultural population, particularly by the increasing of the individual earnings of persons engaged in agriculture; (c) to stabilize markets; (d) to guarantee regular supplies; and (e) to ensure reasonable prices and supplies to consumers. It is of interest to note that neither the attainment of agricultural self-sufficiency nor more liberal trade with outside countries has been listed among the objectives of the common agricultural policy.

The common agricultural policy has two aspects: structural policy as stated under objectives (a) and (b) and market policy as indicated under objectives (c), (d), and (e). These policy objectives are to be promoted by means of (1) gradual alignment of national commodity prices to a uniform level, (2) complete freeing of intra-member trade from existing national restrictions, (3) coordination of member countries' domestic market arrangements and external trade in agricultural products, (4) formulation of quality standards for grading and common rules concerning competition, (5) harmonization of veterinary, plant health, and similar regulations, and (6) establishment of a European Agricultural Guidance and Guarantee Fund to finance market stabilization operations, export subsidies, and structural improvements promoting agricultural efficiency. While the pressure for structural adjustment is clearly recognized, progress so far has been made only in the field of market organization.

⁵ *Treaty Establishing The European Economic Community and Connected Documents*, Publishing Services of the European Communities, Brussels, 1961, p. 47-48.

The core of the Common Market policy is grain policy, with particular emphasis on the setting of the level of grain prices. Target prices are determined annually and set at levels considered necessary for providing a socially satisfactory income for EEC producers. Because target prices exceed those ruling in world markets, domestic producers are protected by a system of variable import levies. These levies are based on the difference between the target price in the importing country and the wholesale market price in the exporting member country or the lowest daily world market price in case of outside countries. Provisions are also made for open-market buying and selling (market intervention) or suspension of imports should fluctuations in domestic supplies threaten the price structure (target prices) of grains within the Community.⁶ The alignment of national prices to a uniform level with the elimination of variable levies on trade among member countries is planned to be in effect by the end of 1969. So far no agreement has been reached concerning the ultimate common price level. Behind this inaction is entrenched nationalism and protectionism in agriculture. There is disagreement among member states also as to what means and at what level protection should be used. Apparently member countries are pressing their own national agricultural interest and attempt to encourage their own production of commodities often competitive with each other. Consequently they do not have a coordinated position on many such commodities.

Tension within EEC increased following the rejection of British membership. This issue is one of the major sources of

contention between France and its five EEC partners and has slowed progress in the integration process in general. It is conceivable, however, that the question of British entry served merely as an excuse for delaying agreement on harmonizing cereal prices, a measure which would give France a competitive advantage over the high-cost producers within the EEC.

In the case of livestock and livestock products, the common policy is contemplated to be pursued by means of (1) variable import levies designed to compensate for differences in feed grain prices among member states on the one hand and that of the world market on the other, (2) fixed import tariffs corresponding with those prevailing in 1962, and (3) supplementary variable import levies to be applied whenever the first two measures appear inadequate to protect domestic prices against low-priced imports from third countries.

While the regulations pertaining to the establishment of a Common Market for agriculture differ substantially among various products, the maintenance of domestic prices above those in the world market will encourage production and pave the way toward self-sufficiency for a wide range of temperate-area farm products. This will reduce the demand for imports and at the same time (1) will deny EEC consumers access to low-cost foods, (2) may require disposal of surpluses by means of export subsidies, (3) will intensify competition in world markets, and (4) will exert a downward pressure on world prices.

Export Prospects for U.S. Wheat and Feed Grains

Wheat. It is conceivable that under pressure from Germany future target prices may be fixed near the higher German or Italian levels of around \$2.92

⁶ For a comprehensive discussion of the main features of the EEC grain policy see USDA, FAS, Foreign Agriculture Circulars FG 11-62 and FG 16-22, Washington, August and September, 1962.

per bushel as compared with about \$2.26 in France. Estimates made by Woermann foresee that the adoption of a common price level based on the 1960 average French-German prices would require the lowering of German wheat and barley prices by about 14 percent. This in turn may cause a decline in net returns per hectare of arable land in the range of DM100 for farms of a size below 20 hectares to DM320 for those of 20 to 100 hectares. The fall in labor returns may vary from 20 to 30 percent.⁷

Should such price levels as one of \$2.92 come about, it is expected that production will be further stimulated, especially in France, and consequently imports from the United States and other outside countries may suffer. Current projections put EEC quality-wheat requirements in 1970 between 1.5 and 2.0 million tons.⁸ If it is assumed that the United States will retain its 1959-60 share (equivalent to 16 percent of imports) in the EEC market, exports could fall to 250,000-320,000 metric tons by 1970.

If the United States is to compete successfully against other suppliers of quality wheat such as Canada and retain its present share of the EEC market, the administration, in cooperation with the export trade, should: (1) intensify efforts within the framework of GATT and with the bargaining power granted under the Trade Agreements Act of 1962 for the reduction of trade barriers, especially those resulting from the implementation of EEC's common agricultural policy; (2) revise grain export standards in such a way as to⁹ (a) eliminate the

⁷ E. Woermann, *Agrarwirtschaft*, March, 1960, No. 3, pp. 104-117.

⁸ EEC, *Problems Relatifs à la Qualité, de la Farine et du Pain dans les Pays de la C.E.E.*, Agr. Series 7, Brussels, 1962, pp. 34-35.

⁹ On this point see USDA, AMS, Data on Proposed Changes in Wheat Standards, AMS-514, Washington, September, 1963.

possibility that foreign buyers will receive wheat of widely differing physical quality within the same grade, (b) discourage the intermixing or blending of lower-grade wheats with higher grades, and (c) reduce the level of unmillable materials and shrunken and broken kernels to that conforming with Canadian standards; (3) make sales on sedimentation guarantees; (4) support research relating to the mechanism of maturing flour without use of chemical additives; and (5) encourage the breeding and selection of wheat varieties not requiring chemical oxidants. The demand for quality wheat is also expected to respond to changes in milling regulations and further progress in the development of commercial baking.¹⁰ All things considered, future increases in the food use of wheat will come about chiefly through population growth.

Feed grains. Table 2 presents projections of probable EEC feed grain import requirements for the year 1970. These projections are based on the assumptions that (1) grain surpluses consisting mainly of French wheat, hitherto exported to third countries, will be absorbed internally; (2) the eventual common level of grain prices may alternatively be set at (a) their prevailing level, (b) the German price level, or (c) the average French-German price

¹⁰ For an elaboration of these and other factors affecting U.S. wheat export prospects, see H. Wayne Bitting, "Observations of Wheat Needs in the European Common Market," *Role of Wheat in the World's Food Supply. Report of Conference* (April 30 to May 2, 1962 at Albany, California) USDA, ARS, WURDD, Albany, May, 1962, pp. 120-126; Edward F. Seeborg, "The Quality Requirements of Foreign Markets," Clifford R. Hope "Opportunities in International Trade," and H. Wayne Bitting and John R. Matchett, "Creating Market Opportunities With Utilization Research," *First National Conference on Wheat Utilization Research, Report of Conference* (October 29-31, 1962 at Lincoln, Nebraska), USDA, ARS, WRRL, Albany, October, 1962, pp. 71-88.

Table 2. — Projected EEC Feed Grain Import Requirements for 1970

	Barley		Corn		Other cereals ^a		Total feed grains	
	World	U.S.	World	U.S.	World	U.S.	World	U.S.
(million metric tons)								
Prevailing grain price level and grain acreage ^b	2.4	.7	4.5	1.8	2.1	1.0	9.0	3.5
Average French-German price level ^c	1.6	.5	3.0	1.3	1.4	.7	6.0	2.5
German price level ^b.....	.9	.3	1.8	.7	.8	.4	3.5	1.4

^a Defined as SITC group 045.

^b It is assumed (1) that without a change in grain prices and acreage under production EEC's imports by 1970 would approximate the 1959-1961 magnitudes and (2) that the raising of French prices to the German level would draw 4 million acres of unused land into production and the resulting expansion in French grain output would reduce EEC's feed grain import requirements approximately by 5.5 million metric tons. Hence, total feed grain imports at the German price level would be equivalent to 3.5 million metric tons. On the relevancy of these assumptions see EEC Commission, *Perspectives "1970,"* Etude No. 10, 1962; Kenneth L. Murray, *France's Key Role in the Grain Sector of the European Common Market*, USDA, FAR-122, April 1963, p. 26-29.

^c An average of import requirements under prevailing prices (first row) and German prices (third row).

level; (3) the commodity structure of overall EEC feed grain imports as well as those obtained from the United States remain the same as that existing in the 1959-1961 period;¹¹ and (4) the United States retains its share of EEC's feed grain imports at the 1959-1961 average of 41 percent.¹² It may be noted that these assumptions essentially coincide with those made by Learn with the exception that Learn does not specifically consider the commodity structure of feed grain imports.¹³

Under the assumed conditions the projected level of EEC feed grain import requirements may range between 3.5 and 9.0 million metric tons in 1970 and those obtained from the United States may vary from 1.4 to 3.5 million metric tons. EEC feed grain imports from the United

¹¹ EEC total feed grain imports consisted of 27 percent of barley, 50 percent of corn, and 23 percent of other cereals. The corresponding figures for feed grain imports obtained from the United States were 20, 50, and 30 percent, respectively.

¹² In terms of individual feed grains imports from the United States accounted for 30 percent of barley, 40 percent of corn, and 47 percent of other cereals.

¹³ Elmer W. Learn, "Long-Term Effects of Common Market Grain Policies," *Foreign Agricultural Trade of the United States*, USDA, ERS, January, 1963, p. 19.

States would fall to 1.4 million tons if the prevailing German price level would be put into effect and to 2.5 million tons in case the average French-German price level would come into force. The current import volume of 3.5 million tons could be maintained only if community prices and grain acreage would remain unchanged at their present levels.

The outcome of these projections will hinge to a considerable extent on (1) the common level of prices ultimately adopted within the community, (2) the price elasticity of demand for and supply of feed grains and livestock products, (3) wheat disposal policies pursued, (4) the degree to which increased efficiency in the utilization of feed grains reduces dependence on outside supplies, (5) improved management practices in livestock feeding to increase the rate of feeding per animal unit, and (6) the continuation of upward trends in productivity at least as great as those of the past decade. The probable raising of national feed grain prices in all member states but Germany in combination with higher import levies may tend to slow down EEC imports by providing an inducement for expanding domestic production and by restraining expansion of

demand for both feed grains and livestock products.¹⁴

Apart from the question of the absolute level of feed grain prices, the position of U.S. exports may also be affected by the prospective relationship between wheat and feed grain prices. At present the gap between feed grain and wheat price levels is narrowest in Germany and the Netherlands and widest in Italy with Belgium and France in between. Specifically, whereas producer prices of barley in the first two countries average about 86 to 90 percent of the wheat prices, in Belgium and France they range between 80 and 85 percent. By contrast, corn prices in Italy are only 60 percent of wheat prices.

Insofar as producers are responsive to changes in relative prices, the raising of feed grain prices relative to that of wheat should encourage both the production of feed grains and the diversion of low-grade wheat into feed uses. These developments in turn will have a bearing on the extent to which lands now under grass, in root crops, or idle are drawn into feed grain production and wheat surpluses are disposed through subsidized exports or "Food-for-Peace Programs." According to authority granted on December 18, 1962, member countries are permitted to make payment of export subsidies on wheat and flour from \$6 to \$8 per metric ton.

In addition to these considerations and factors, the outlook for U.S. feed grain exports may also reflect: (1) the development and success of common programs facilitating structural adjustment by encouraging the movement of underem-

¹⁴ Learn's projections suggest that grain consumption by livestock could increase as much as 2.9 million tons should EEC adopt a price level approximating that of C.I.F. price of U.S. barley rather than the threshold price of barley in Germany. See, Elmer Learn "Long-Term Effects of Common Market Grain Policies," *op. cit.*, p. 16-17.

ployed labor out of agriculture, bringing about more efficient sized units of production, meeting the capital needs for larger and more efficient production units, and bringing about consolidation of fragmented units; (2) production conditions and export availabilities in third countries and their competitiveness in the EEC market;¹⁵ (3) the possible entry of the United Kingdom and other countries into EEC and its corollary the terms of protection accorded to commonwealth products, particularly those of the temperate-zone countries of Australia, Canada, and New Zealand; and (4) the success of current multilateral negotiations conducted under GATT auspices aimed at reducing or abolishing barriers which inhibit interregional trade.

Because the evolving institutional framework of EEC is expected to be nondiscriminatory toward third countries in the sense that it uniformly affects them all, the volume and area distribution pattern of feed grain imports will tend mainly to reflect differences in the ability of the various suppliers to offer commodities which meet the price, quality, and time-delivery requirements of EEC customers. For this reason it is imperative that both U.S. producers and exporters make efforts toward adjusting production and improving marketing techniques conforming with EEC demand specifications and enlarge the scope and character of market development activities carried on jointly or independently by producer and trade groups with the USDA.¹⁶

¹⁵ Argentina and Brazil are the largest corn producers in South America and compete with the United States for the EEC market. Also, corn production in Africa has been stepped up recently.

¹⁶ For an elaboration of the importance of market development programs in the promotion of U.S. exports see USDA FES, *Toward Maintaining and Expanding Markets in Western Europe for U.S. Farm Products*, Washington, February, 1963, p. 41-48.

In regard to multilateral consultation and confrontation procedures called for by the terms of accession to GATT, opportunities exist to arrive at a new *modus vivendi* for international trade in feed grains that would (a) produce no new gains for the United States but merely maintain the status quo based on present market shares, (b) achieve some moderation in the restrictive features of the common agricultural policy in exchange for compensatory U.S. tariff concessions on industrial goods, (c) result in market-access arrangements built around a system of worldwide commodity-by-commodity agreements,¹⁷ and (d) tighten controls over the invocation of escape clauses as permitted under present GATT rules.

Summary and Conclusions

On the basis of changes in market shares, between 1951 and 1961 the United States achieved gains in fresh meats, rice, barley, miscellaneous cereals, feeding stuffs, margarine and shortenings, hides and skins, oilseeds, and animal oils and fats. There were losses in market shares of prepared meats (canned and uncanned), butter, cheese, wheat and wheat flour, corn, tobacco, vegetable oils, and processed oils and fats. The U.S. share of egg imports remained the same.

Factors affecting the magnitude and pattern of EEC's agricultural imports included changes in the degree of self-

¹⁷ Such agreements might be patterned after the International Wheat Agreements whereby importing countries undertake to purchase agreed quantities and exporting countries to provide a certain quantity within an agreed price range. On the shortcomings of international commodity agreements with particular reference to the scheme enunciated in the French Plan see J. N. Lewis, "The French Plan, Blueprint for World Trade Without Tears?" Review of Marketing and Agricultural Economics, Vol. 30, No. 3 (September, 1962), Sydney, Australia.

sufficiency, improvement in consumption standards as revealed by adoption of more diversified and nutritionally better-balanced diets, and the margin of protection and preference accorded to domestic producers and those of the associated overseas countries.

Grains. With the rise in intra-EEC wheat production and the marked trend in favor of higher-quality foods, exporters of both hard and soft wheat varieties to the EEC will probably find themselves reduced to the position of residual suppliers. By contrast, indications are that the anticipated increase in domestic feed grain production will not be sufficient to cover an expanding demand, and imports from the United States may continue at their present level, depending, of course, on the level of common grain prices ultimately established at the end of the transition period.

Meat. Assuming that past production and consumption patterns continue in years to come, the prospect of EEC meat economy appears to be increasingly one of surpluses rather than deficits. Consequential to the introduction of the variable levy against pork products, it appears doubtful whether the United States will be able to maintain its variety meat exports at their current level. One of the casualties in this group might be pork livers, with exports running about \$10 million a year.¹⁸ It is also anticipated that EEC will produce 99 percent of its beef requirements by 1970. With respect to poultry, the implementation of the intra-EEC preference system in all probability will stimulate production in the Benelux, France, and Italy and diminish the competitive position of U.S. products. Unless the United States succeeds in obtaining the lowering of import levies,

¹⁸ Effective September 2, 1963, fresh and frozen pork variety meats were subject to the fixed 20 percent common external tariff.

which at prevailing rates are equivalent to a tariff of 47 percent, it will have to face the loss of this growing market.

Oilseeds, oils, and fats. This group comprises a large number of individual commodities with widely differing qualities and use potentials. In terms of principal subaggregates U.S. export prospects are expected to be affected by: (1) the nature of the common agricultural policy and its impact on (a) the indigenous supply of oil seeds and animal fats, (b) the price relationship among and between vegetable oils and animal fats,¹⁹ (c) the price relationship between feed grains and protein meals, (d) utilization pattern of oils and fats (food vs. industrial), and (e) the elasticity of supply and scope of preferential treatment accorded to oilseeds and oils originating in associated overseas countries; and (2) the export availability and competitive position of oilseed and oils produced in third countries. Production is expected to keep pace with consumption, and hence EEC's net import requirements would remain at their present

¹⁹ Because of a wide margin of interchangeability in use, demand is highly responsive to changes in relative prices of competitive products. Similarly, subsidies on butter consumption have repercussions on the demand for vegetable oils.

level.²⁰ Thus it seems likely that while the United States will encounter heavier competition from both within and without EEC than heretofore, there is a good chance that it will retain its present share in oils and fats.

With respect to oilseeds, meals, inedible tallow, and fats the outlook is favorable. With the rise in livestock production, demand for feeds is expected to rise. There is evidence that inedible tallow and fats have gained wide acceptance as additives to poultry and livestock feeds particularly in Italy and the Netherlands, thus offsetting the fall in demand caused by shifts to chemical detergents.

The outlook for dairy products, margarine, shortenings, eggs, hides and skins, and tobacco is anything but encouraging. At prevailing levels of self-sufficiency and projected expansion in production, the best that can be anticipated is that they will be maintained at their present scale. Excepting hides and skins, most of these products will be burdened also with import duties and other trade barriers.

²⁰ See also, UN, FAO, *Agricultural Commodity Projections for 1970*, FAO Commodity Review 1962, Special Supplement E/CN. 13/48, CCP 62/5, Rome, May, 1962, p. 11-23.

Farm Organization in the U.S.S.R.

C. B. BAKER and E. R. SWANSON

IN THE ORGANIZATION OF Soviet agriculture, the key words are collectivize, mechanize, and specialize. To accomplish these tasks, all farms are organized as either collective (*kolkhoz*) or state (*sovkhоз*) farms. The number of collective farms declined from 67,700 in 1958 to 39,800 in 1962. The number of state farms increased from 3,171 in 1958 to 4,606 in 1962. The average sown area for collectives in 1961 was about 6,600 acres, for state farms about 23,800 acres.

The pre-Revolution village-type agriculture facilitated collectivization in the early Soviet period. The state farms were organized on land already state-owned or on huge landed estates converted to state ownership from single family-owned holdings. Additional state farms followed in the wake of World War II in areas severely ravaged by advancing and retreating armies. However, the movement was retarded by collectives hastily regrouped, thus attesting to the popularity of the collective farm as of this date. In 1960, 1961, and 1962 a substantial transition of collectives to state farms took place.

Collectivize

Although Soviet authorities expect a single type of farm to eventually prevail, its exact nature has not been made explicit. State farms appear highly favored in principle, but there is considerable pride in the relative independence of the collectives. However, the government does limit independence of collectives through prices, norms for indivisible funds, negotiations for loans for new investments, and other controls. In any event, collectives are, for the present, indispensable. They provide a far higher

percentage of their own investment, an important fact in an economy reluctant to allocate to agriculture larger fractions of capital goods in short supply generally. Moreover, the collectives employ a large number of workers who otherwise would have little alternative employment. In a society that "guarantees" everyone a job, this latter point is important. On state farms, workers are employed on an "as needed" basis. This fact, along with the larger capital investment per worker on state farms, accounts for the reported 1.8 times higher productivity per worker on state farms than on collective farms.

In the U.S.S.R., increases in mechanization are retarded by lack of investment funds available for this purpose. Such funds are derived from the difference between: (1) returns, at state-determined prices for products, and (2) cost of purchased inputs, taxes, and payments to workers. On the state farms these payments are fixed wages and on collectives, payments are disbursements to workers from the residual. In either case, an indivisible fund is thus provided for investment in the farm. The essential difference is that on state farms, wages are guaranteed while on collectives, wages depend on the level of net income for a particular year. The difference is easily overstated since, in practice, state farm workers are paid bonuses for such items as cost reductions below established targets, and overfulfillment of quotas. Further indication of the diminishing difference between state and collective labor payments is that the most efficient one-fourth of the collectives (in the Ukraine, the top one-third) pay workers guaranteed minima as do state farms.

There remain small private plots, however, on both collective and state farms,

which occupy about 3 to 4 percent of the sown area. They average about 0.7 acre per household on collectives. The objective of the private plot is to provide subsistence to the worker through the year, pending payment of his share of the collective output of the farm. In fact, as many have observed, it is a source of a considerable fraction of the income of workers, and is a source of a large fraction of agricultural output in the U.S.S.R. For example, about 45 percent of the meat, milk, and vegetables was produced in the private sector in 1961. In all, 30 percent or more of agricultural production comes from private plots. This phenomenon continues to attract considerable attention. It must be said, however, that private plots absorb significant inputs formally ascribed to the socialized fraction of the farms, thus leading to an overstatement of productivity in the case of the private plots and an understatement of productivity for the socialized segment of agriculture.

The official view of private plots oscillates over time. The current position appears to be that eventually they will vanish. The oscillation is merely about a steady resolve to banish them as the organization of socialized agriculture improves. Discouraged presently in the U.S.S.R., private plots are encouraged, relatively, in Bulgaria. As an interesting footnote, we observe that the payment of a guaranteed minimum to collective workers may be a means to change the economic structure of the collective in fact while leaving the collectives unchanged institutionally. One is told, incidentally, that on the top collectives, private plots are no longer important.

Mechanize

Mechanization has been attractive to agricultural planners since the early days of the Soviet period. One is often left

with the impression that mechanization is held as a goal rather than as a means toward an end. Thus a senior staff member in the Institute of National Economy in Kiev said simply that their goal in corn production is "to eliminate manual labor" in the process. Given the relative supplies of labor and capital available in the past to Soviet agriculture, some have argued that such a goal has been inconsistent with the goal of rapid economic growth, particularly for a nation in the technological and organizational state of the U.S.S.R. through at least the 1940s.

It might be argued that a rapid rate of mechanization would be more defensible now than in the past, as the need develops for capital-using, labor-saving innovations to generate still further increases in per capita output. However, two factors seriously impair the ability to mechanize Soviet agriculture much faster. The first, already mentioned, is the shortage of real capital goods to allocate to the agricultural sector. The second is the necessity to improve the quality of the labor force as mechanization is increased. Human qualities required for efficient use of sophisticated machinery in agriculture are in great demand in nonagricultural sectors of the Soviet economy. Moreover, there remains the guarantee of employment somewhere in the Soviet system of all workers. There is considerable evidence that Soviet planners are willing to use agriculture as the residual claimant for those ill-fitted for skilled or semi-skilled employment.

Undergraduates in agricultural colleges in the U.S.S.R., are required to spend summers in "practical work." This often means simply learning to drive tractors and handle farm machinery. We were asked on several occasions where this was accomplished in U.S. agricultural colleges! (Awaiting a bus to return

to Moscow, we observed two students at Timiryazev Agricultural Academy untangling a tractor-powered four-section spike-tooth harrow from a fence, thus underscoring the advisability of such training under the circumstances found in the U.S.S.R.)

Specialize

Among the many possible concepts of "specialization," main interest in the U.S.S.R. seems to center on specialization of individuals. Resources are alleged to be allocated among farms in a given Republic in accordance with past records of relative productivity in terms of alternate products. Productivity is reflected in "self-cost of production"—i.e., total cost less social overhead costs. In arranging for credit, it is likely that the regional authorities, the state farm director (or collective farm chairman), and the relevant gosbank official arrive at a decision influenced by past relative productivity in different enterprises. However, there are two restrictions on the faster development of interregional specialization.

First is the requirement that each major population center be supplied from nearby agriculture with perishables. The reasons for this are likely to be shortages in transportation and refrigeration facilities. Thus one finds, strangely enough, substantial dairy enterprises in the semiarid agriculture of Kazakhstan. Soviet agricultural economists appear to have done little, at least empirically, in applying sophisticated research techniques to problems of interregion specialization, in contrast with their counterparts in the United States. When asked about this contrast, the agricultural economists indicated the importance of production relative to transportation costs.

Second, even within farms, there remains a fairly important subsistence

aspect in the allocation and organization of resources. This may be more significant on collective than on state farms. In any event, it reflects a characteristic of village-type agriculture. We stress this since it is important to recognize that there has never been in Russian agriculture a significant number of open-country, family-farm units.

The basic unit in either a collective or state farm is the "brigade," a collection of workers organized to accomplish a particular task. For example, there may be a field brigade, whose functions include land preparation, seeding, tilling, and harvest. There may be a livestock brigade to prepare and distribute feed, to perform the various associated husbandry tasks, and perhaps to process the product of a livestock enterprise. There may be a "complex" brigade, with some functions similar to those of a field brigade (for example, to harvest crops) and some similar to those of a livestock brigade. As a rule, brigades were observed to be defined roughly in terms of enterprises. Their size is measured, typically, in terms of number of workers.

A "subdivision" may include three or four brigades and has many of the characteristics of a social as well as an economic unit. A subdivision may include a residential cluster, for example, perhaps including an elementary school. There may be from three to as many as eleven subdivisions within the confines of a given farm. Some elementary accounting is also done even at the subdivision level.

The essential administrative differences between collective and state farms occur at the top echelon. In a collective, an executive committee is required to meet at least twice monthly on short-run problems of management. The chairman of the executive committee is elected every two years by a "Supreme Board"

comprised of one representative elected from each brigade. The chairman, in effect, assumes substantial responsibility for directing affairs of the collective farm which, in turn, possesses greater autonomy than is found for state farms.

Management of a state farm is in the hands of a director who operates, with one or more deputies, through subdivisions, each headed by a subdirector. Thus the autonomy found in collective farms is absent not only at the top, but in the subunits of state farms as well. Some specialization is common among deputies, one assuming responsibility for production, others for finance, transportation, supply, housing, etc. Where the pattern of production is complex, as in the first case described below, the production responsibilities may be divided among several deputies.

Examples

The single visitor in the U.S.S.R. is likely to experience some difficulty in visiting a Soviet farm. There are several reasons: (1) The farms are large and distant; (2) transportation is not as convenient as in the United States and is more expensive because it is not always on regularly scheduled routes of public transportation; (3) the formal organizational structure of the farms mitigates against anything like the *ad hoc* visits possible on United States farms; and (4) the bureaucratic overhead provides a formidable barrier to the foreign visitor. In any event the two farms described below must be considered as far from typical of farms in the Ukraine itself, to say nothing of the U.S.S.R. Both are close to the city of Kiev (population: 1,200,000), highly developed in terms of mechanization, and prosperous, relatively, in terms of income earned by workers. Yet one observes even on these farms several of the problems referred to above. Also, a fair notion of labor

productivity can be inferred from the listing of the work force in the brigades handling the dairy enterprise.

A Dairy, Fruit, Vegetable, and Wheat Farm. This state farm has 13,738 acres of land. In the socialized part of the farm, there are 7,346 acres of arable land, 4,984 acres in forests and roads, and 420 acres in permanent pasture. There are 988 acres in private plots. The farm is staffed with 1,120 workers. Six hundred and twenty are housed in separate dwellings, 500 distributed over nineteen dormitories. In the latter, 350 workers are single and 150 are married and live in flats. The dormitories are clean and adequate but spartan in terms of creature comforts.

The farm is divided into five subdivisions, each with approximately an equal amount of land and access to machinery, with its own settlement of private houses and dormitories, comprised of rooms and flats, and a kindergarten. For the farm as a whole, there is a school for children between the ages of seven and fifteen, and a workers' club. The farm has a central depot for 65 tractors, 52 trucks, 15 milk cars, one automobile, 6 self-propelled grain combines, 10 forage harvesters, and other land preparation, tillage, and harvest equipment.

On the socialized arable land in 1963, there were 1,447 acres of orchard (largely apple, the most profitable enterprise, according to the director), 930 acres of vegetables, not counting those that are interplanted in the orchards where the trees are planted on a 10-by-10-meter plan, 741 acres of potatoes, 1,730 acres of corn, 2,045 acres of spring and winter wheat and rye, and 455 acres of rotation forage. Seven hundred and seventy cows were being milked, in a herd of 1,430 dairy animals. Feed per cow (including supporting animals) in 1962 amounted to 18 tons of silage,

2.5 tons of grass hay, and 1.5 tons of straw per year. The cows produced 3,718,000 pounds (4,830 pounds per cow milked) of 3.8 percent milk in 1962. Of this production 66,000 pounds was distributed to workers (at 11 kopeks per liter) and 3,652,000 pounds to the state (also at 11 kopeks per liter, although the retail price was 24 kopeks per liter).

Management is provided by a "Management Board," comprised of a director (an agricultural economics graduate) and five vice-directors (an agronomist, a zootechnician, a veterinarian, an engineer, and an accountant). The labor force is divided into seventeen field brigades and three cattle brigades. Each of the latter is responsible for 200 to 300 milk cows plus supporting dairy animals, and in addition, harvested crops required for their feed supply. The composition of a cattle brigade, including rates of pay, is as follows:

Job ¹	Pay (rubles ² per mo.)
Milkers (10).....	95-100
(paid according to amount of milk obtained)	
Calf tenders (5).....	80
Feed handlers (10).....	80-90
Cleaners (5).....	60
Milk transportation (3).....	120
Milk quality (1).....	52
Zootechnicians (2).....	72
Feed replacements (5).....	80
Electricians (2).....	72
Mechanics (2).....	70
Storeman and weigher (1).....	60
Harvest (hay and silage) (24).....	50-60

¹ The number of workers in each job is indicated in parentheses.

² The official exchange rate is one ruble equals \$1.10.

Cows are milked three times daily. Milk is pooled for the farm as a whole before being delivered. Milk is not cooled except in the summer months of June, July, and August, and is pasteurized after delivery off the farm. On this farm, 90 percent of the cows are machine-milked, although for the U.S.S.R. as a whole, this figure is prob-

ably not more than 20 percent of the milk cows. Calves are nursed by nurse cows.

As on other state farms, profit on this farm is generated by attaining a production cost less than called for in the plan. Any such profit is divided between expansion of investment, addition to social services, and payment of bonuses to the workers (including administrative workers).

A Vegetable "Factory." Although referred to as a factory, this state farm, established in 1947, is really a production unit, with no canning or processing. It is one of the 46 specialized state farms surrounding Kiev. The production is almost exclusively for the city of Kiev. In 1962, this farm produced about 1,300 tons of vegetables, with the principal crops being cucumbers and tomatoes. All production takes place under glass. At present there are about 15 acres of greenhouses with plans to expand to 37 acres by 1965.

About one-fourth of the present facilities use the hydroponic method with a high degree of control over the plant food solutions. These solutions are varied according to the stage of plant growth. All of the new facilities will use the hydroponic method which, according to this farm's records, has shown an increase in yield of 50 percent and a drop of 30 percent in the cost of production as compared with the conventional type of greenhouse. Further, the manager indicated an improved quality of product under the hydroponic method.

Approximately 250 persons were employed in this operation during 1962. Because the production goal was exceeded during this year, the workers received a bonus, bringing their average wage to 112 rubles per month. The living quarters on the edge of the city could not be distinguished in appearance from those of workers in the other part of the city.

**CONTRIBUTORS
TO THIS
ISSUE**



V. W. DAVIS is an Agricultural Economist with the U.S. Department of Agriculture, cooperating with the University of Illinois. In addition to research in the organization of farms, he has studied the economics of irrigation and the harvesting and handling of corn.



NORMAN COWARD is a graduate of Wye College, London University School of Agriculture. He attended the University of Illinois in 1961-62 and received the M.S. degree. He is now doing advisory and research work in farm management for the Milk Marketing Board of England.



R. W. BARTLETT has written extensively in the field of dairy marketing. His first book in this field, *Cooperation in Marketing Dairy Products*, was published in 1931. It was followed by *The Price of Milk* in 1941 and *The Milk Industry* in 1945. Dr. Bartlett also has followed closely the economic developments of postwar Europe.



S. C. SCHMIDT is conducting research on the export market for U.S. agricultural commodities. Prior to coming to the University of Illinois in 1959, he was on the staff at the University of Kentucky and at Montana State College. He holds a Ph.D. degree from McGill University.



C. B. BAKER teaches courses in agricultural finance and research methodology. As a part of the cultural exchange program between the United States and the Soviet Union, he and E. R. Swanson visited the USSR in the spring of 1963. They visited educational and research institutions in Moscow, Leningrad, and Kiev.

UNIVERSITY OF ILLINOIS
AGRICULTURAL EXPERIMENT STATION
Urbana, Illinois
Free — Publication • Permit No. 1114 • 5M
LOUIS B. HOWARD, Director

Penalty for private use to avoid payment of postage, \$300

UNIVERSITY OF ILLINOIS-URBANA



3 0112 111886799

POSTMASTER: Please return free if unclaimed.
See Postal Laws and Regulations.

ILLINOIS AGRICULTURAL ECONOMICS is published semiannually by the Department of Agricultural Economics of the Illinois Agricultural Experiment Station. Louis B. Howard is Director of the Station, and M. B. Russell is Associate Director. Harold G. Halcrow is Head of the Department of Agricultural Economics.

This periodical reports studies carried on by members of the Department. Material appearing here may be reprinted, provided meaning is not changed, no endorsement of a commercial product or firm is implied, and credit is given to the author and this issue of **Illinois Agricultural Economics**.

To receive the publication regularly, write to the editor, Earl R. Swanson, Department of Agricultural Economics, University of Illinois, Urbana, Illinois. There is no charge.